159

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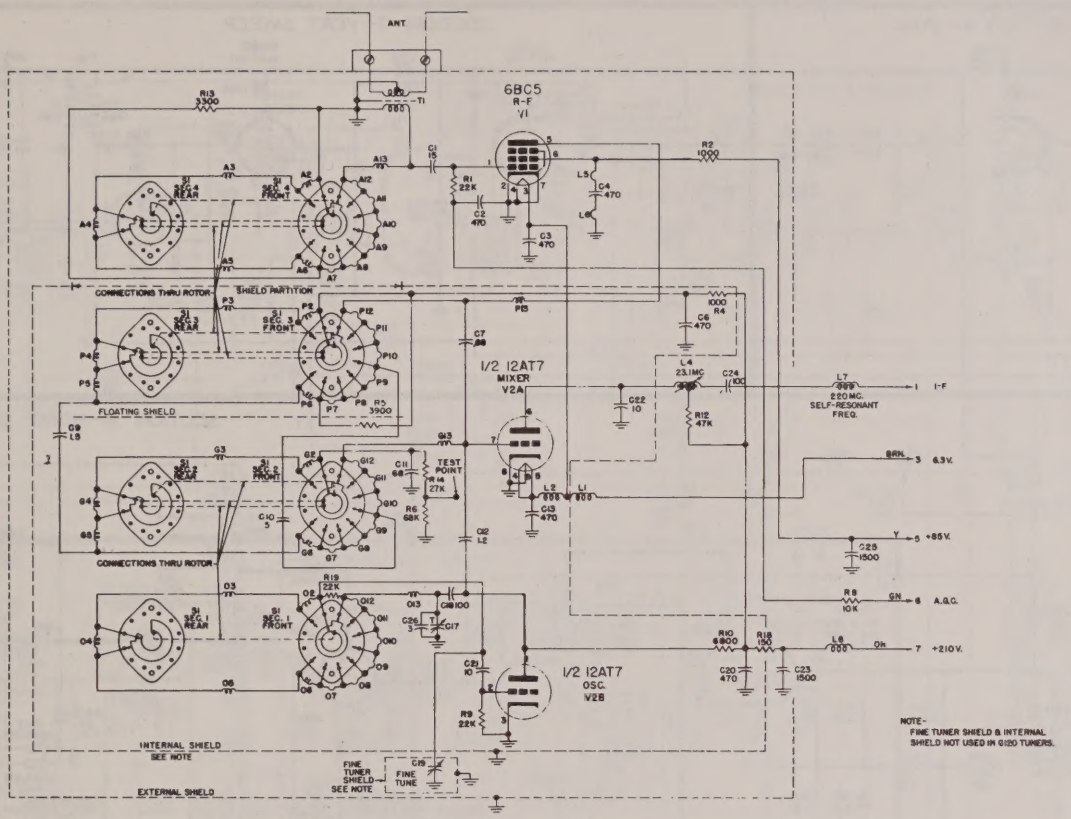
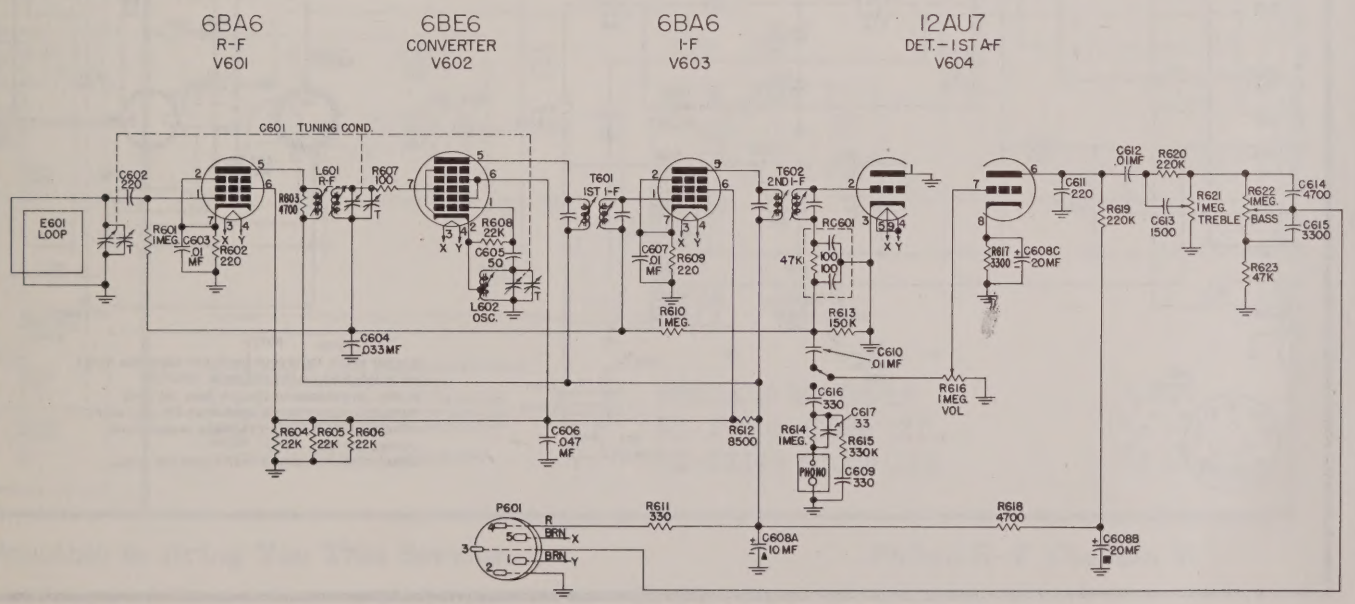
PROPERTY OF


ANT.
6BC5
R-F
V1
R13 3300
T1
R1 22K
C1 15
C2 470
C3 470
R2 1000
L5
C4 470
L6
CONNECTIONS THRU ROTOR
SHIELD PARTITION
R4 1000
C6 470
C7 68
1/2 12AT7
MIXER
V2A
L4 23.1MC
C24 100
L7 220MC. SELF-RESONANT FREQ.
1 I-F
C22 10
R12 47K
FLOATING SHIELD
C9 L8
TEST POINT
R14 27K
R6 68K
C13 470
L2
L1
BRN. 3 6.3V.
C10 5
C12 L2
C25 1500
Y 5 +85V.
R19 22K
C14 100
C26 3
C17
R8 10K
GN 6 A.G.C.
R10 8800
R18 150
L8
OR 7 +210V.
C21 10
1/2 12AT7
OSC.
V2B
C20 470
C23 1500
R9 22K
NOTE- FINE TUNER SHIELD & INTERNAL SHIELD NOT USED IN G120 TUNERS.
INTERNAL SHIELD
SEE NOTE
FINE TUNER SHIELD SEE NOTE
C15 FINE TUNE
EXTERNAL SHIELD


6BA6
R-F
V601
6BE6
CONVERTER
V602
6BA6
I-F
V603
12AU7
DET.-1ST A-F
V604
C601 TUNING COND.
C602 220
E601 LOOP
R601 1MEG.
C603 .01 MF
R602 220
L601 R-F
R603 4700
R607 100
R608 22K
C605 50
L602 OSC.
C604 .033MF
T601 1ST I-F
C607 .01 MF
R609 220
R610 1MEG.
T602 2ND I-F
R606 47K
100
100
R613 150K
C610 .01MF
R616 1MEG. VOL
C611 220
C612 .01MF
R620 220K
R619 220K
C613 1500
R621 1MEG. TREBLE
R622 1MEG. BASS
C614 4700
C615 3300
R623 47K
R617 3300
C608C 20MF
R604 22K
R605 22K
R606 22K
C606 .047 MF
R612 8500
C616 330
C617 33
R614 1MEG.
R615 330K
PHONO
C609 330
P601
R611 330
R618 4700
C608A 10 MF
C608B 20MF

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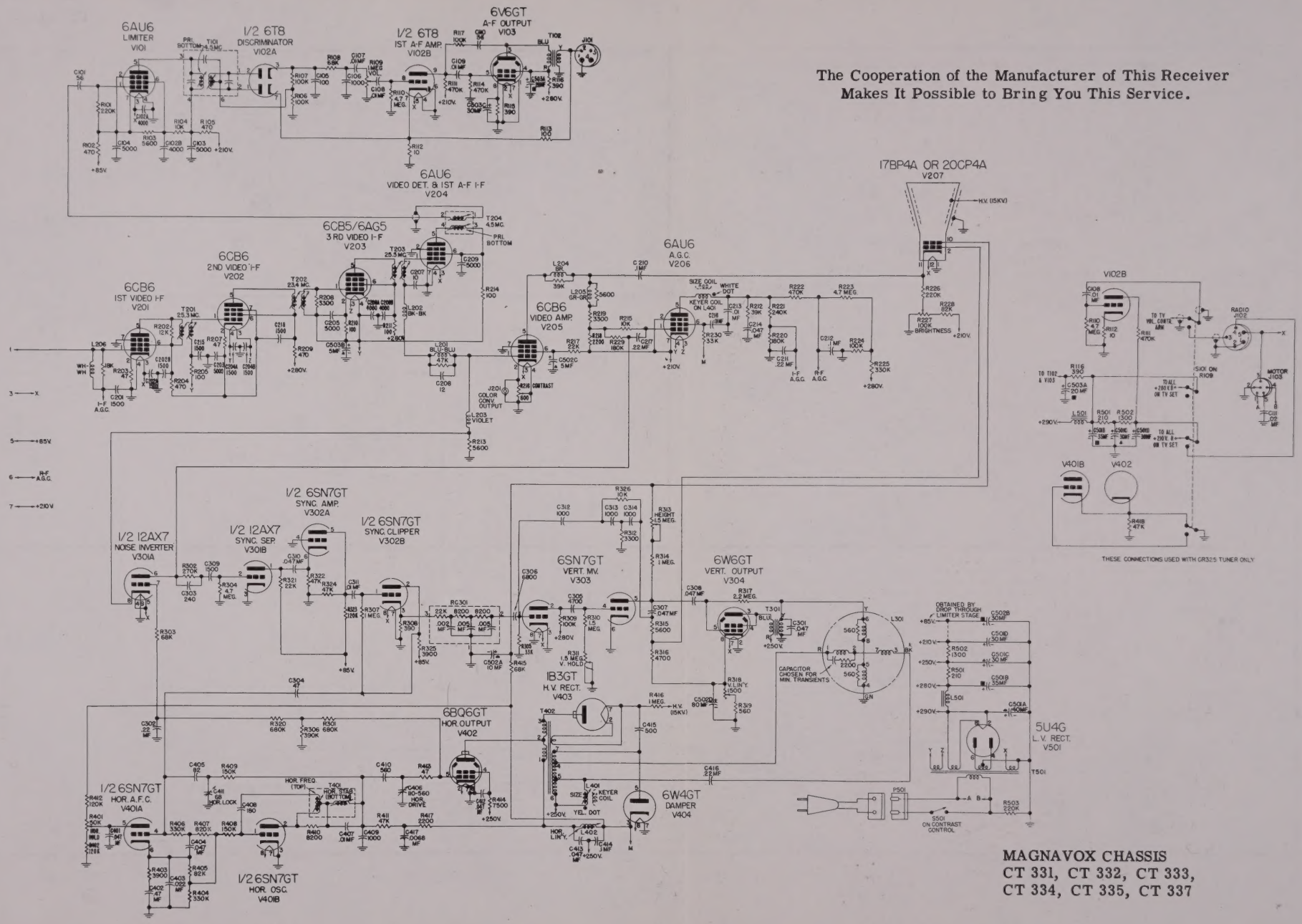

MAGNAVOX CHASSIS
CT 331, CT 332, CT 333,
CT 334, CT 335, CT 337

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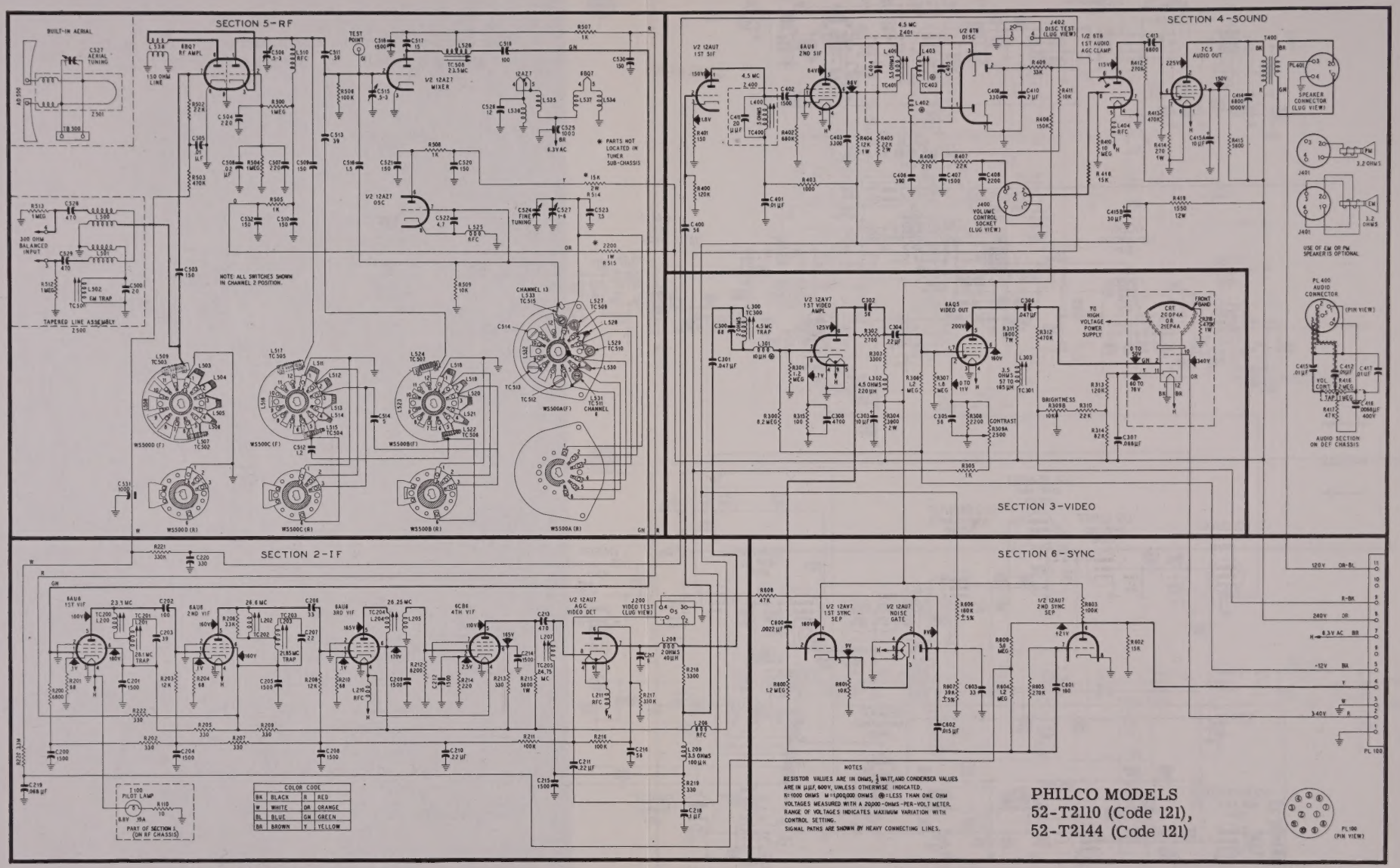
3924 MEADE ST.
DENVER, COLORADO


SECTION 5-RF
SECTION 4-SOUND
SECTION 3-VIDEO
SECTION 2-IF
SECTION 6-SYNC
NOTE: ALL SWITCHES SHOWN IN CHANNEL 2 POSITION.
PARTS NOT LOCATED IN TUNER SUB-CHASSIS
USE OF EM OR PM SPEAKER IS OPTIONAL
AUDIO SECTION ON DEF CHASSIS
COLOR CODE
BK BLACK R RED
W WHITE OR ORANGE
BL BLUE GN GREEN
BR BROWN Y YELLOW
NOTES
RESISTOR VALUES ARE IN OHMS, ½ WATT, AND CONDENSER VALUES ARE IN µµF, 600V, UNLESS OTHERWISE INDICATED.
K=1000 OHMS M=1,000,000 OHMS ⊕=LESS THAN ONE OHM
VOLTAGES MEASURED WITH A 20,000-OHMS-PER-VOLT METER. RANGE OF VOLTAGES INDICATES MAXIMUM VARIATION WITH CONTROL SETTING.
SIGNAL PATHS ARE SHOWN BY HEAVY CONNECTING LINES.
PHILCO MODELS
52-T2110 (Code 121),
52-T2144 (Code 121)

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Philco R-F Chassis 41

PRELIMINARY DATA
The data contained in this folder is published in advance of regular PHOTOFACT Coverage

SET 159 FOLDER 1A

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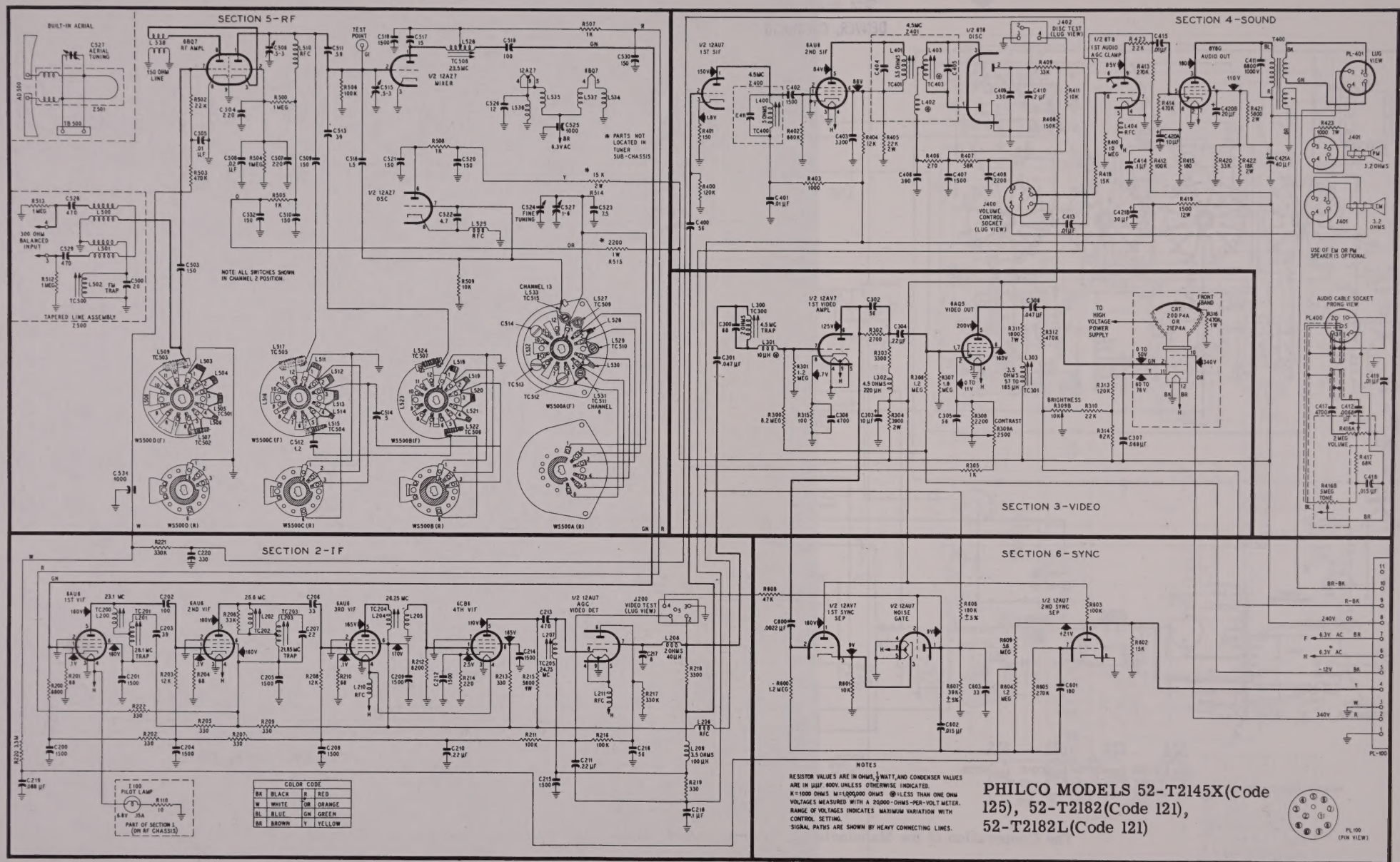
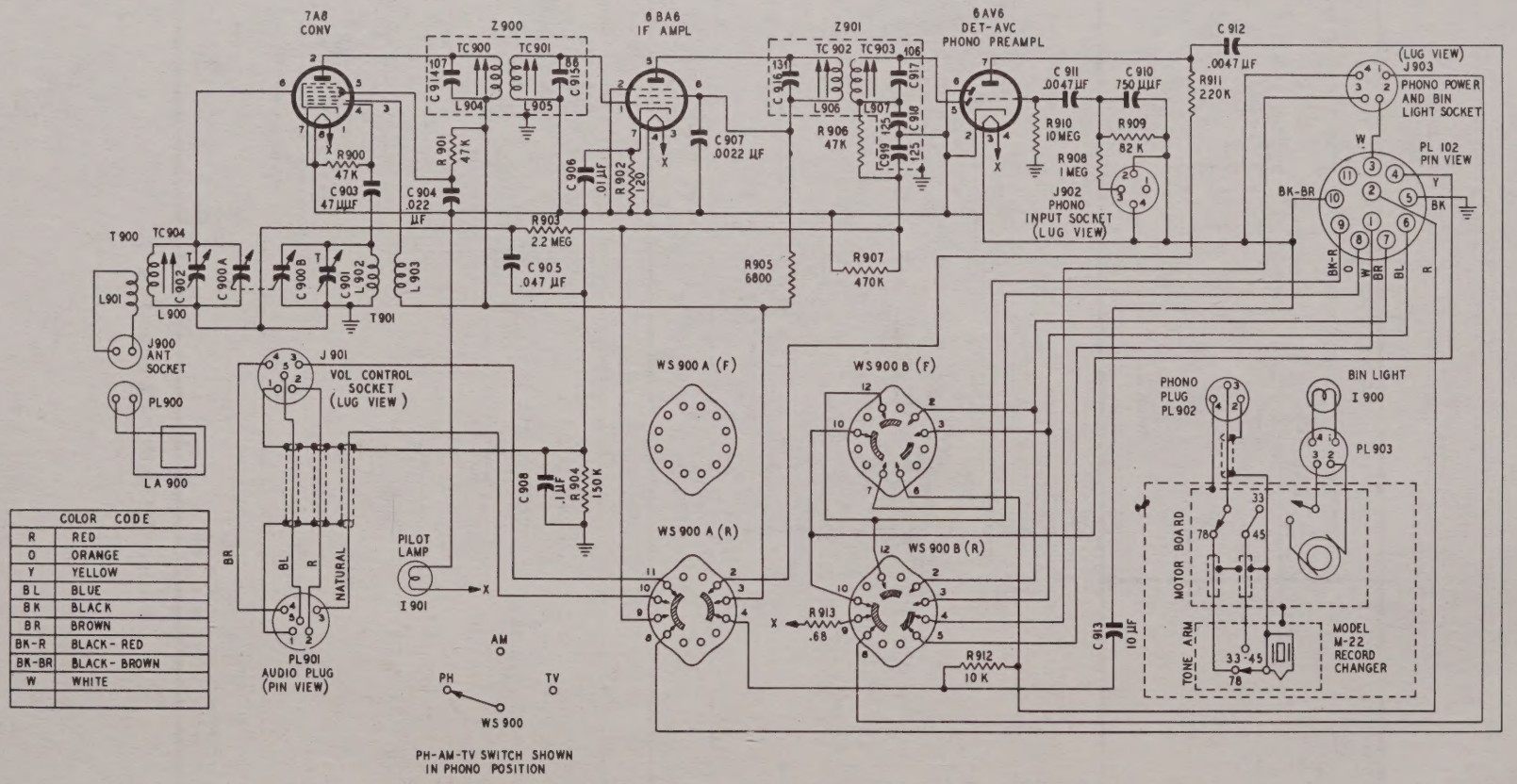
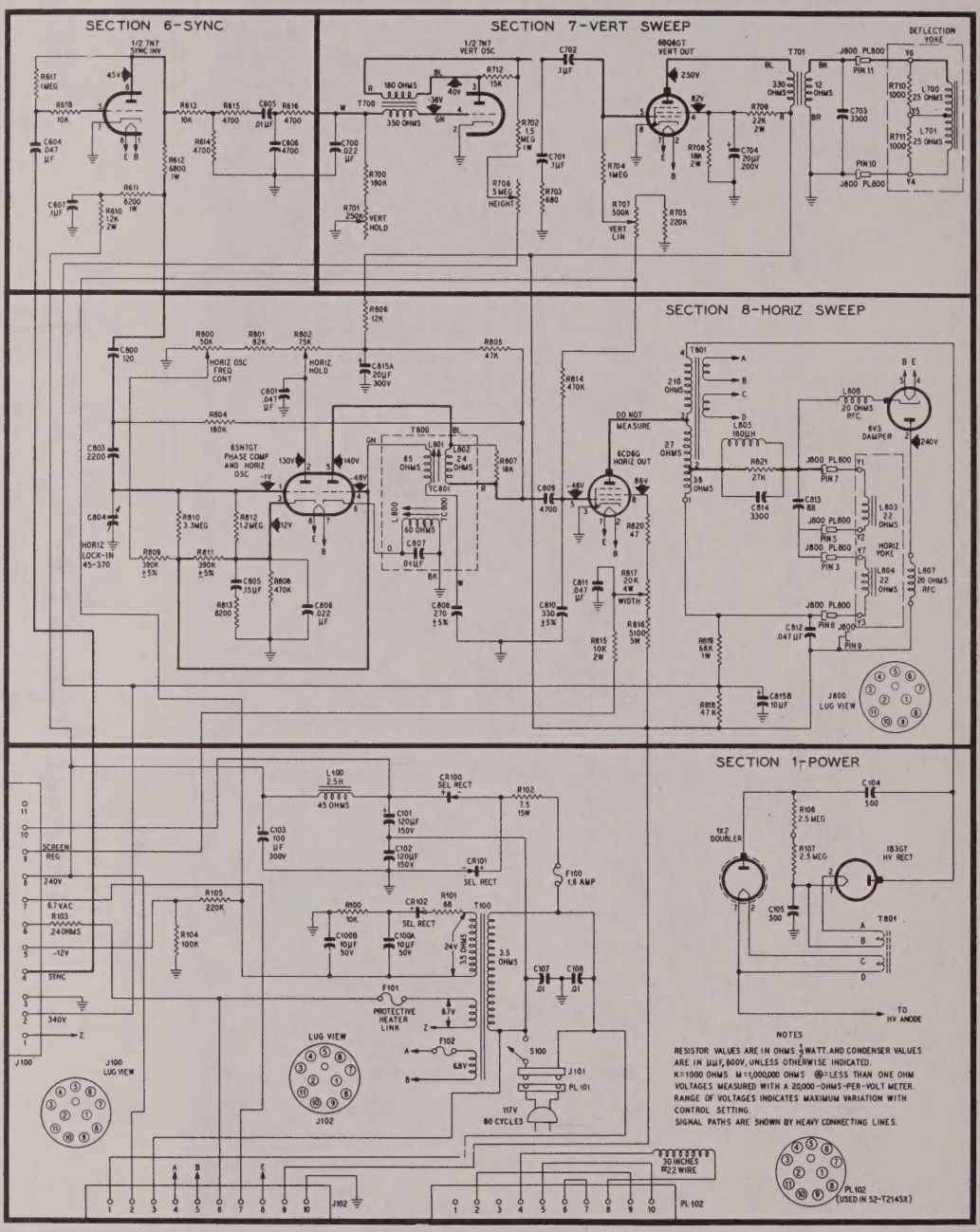

SECTION 5-RF
SECTION 4-SOUND
SECTION 3-VIDEO
SECTION 2-IF
SECTION 6-SYNC
BUILT-IN AERIAL
C527 AERIAL TUNING
Z501
TB 500
150 OHM LINE
TEST POINT
V2 12AT7 1ST SIF
8AU8 2ND SIF
1/2 6T8 DISC
J402 DISC TEST (LUG VIEW)
1/2 6T8 1ST AUDIO AGC CLAMP
6T8G AUDIO OUT
PL-401 LUG VIEW
J401 3.2 OHMS
J400 VOLUME CONTROL SOCKET (LUG VIEW)
* PARTS NOT LOCATED IN TUNER SUB-CHASSIS
USE OF EM OR PM SPEAKER IS OPTIONAL
300 OHM BALANCED INPUT
TAPERED LINE ASSEMBLY Z500
NOTE: ALL SWITCHES SHOWN IN CHANNEL 2 POSITION.
CHANNEL 13 L533 TC515
CHANNEL 6
W5500A(F)
W5500B(F)
W5500C(F)
W5500D(F)
W5500A(R)
W5500B(R)
W5500C(R)
W5500D(R)
V2 12AV7 1ST VIDEO AMPL
8AQ5 VIDEO OUT
TO HIGH VOLTAGE POWER SUPPLY
CRT 20DP4A OR 21EP4A
FRONT BOARD
BRIGHTNESS R309B 10K
CONTRAST R309A 2500
AUDIO CABLE SOCKET PRONG VIEW
PL400
2 MEG VOLUME
TONE
6BQ7 RF AMPL
V2 12AZ7 MIXER
V2 12AZ7 OSC
6AU6 1ST VIF
6AU6 2ND VIF
6AU6 3RD VIF
6CB6 4TH VIF
1/2 12AU7 AGC VIDEO DET
J200 VIDEO TEST (LUG VIEW)
23.1 MC
28.6 MC
28.25 MC
21.85 MC TRAP
28.1 MC TRAP
J100 PILOT LAMP
PART OF SECTION L ON RF CHASSIS
1/2 12AV7 1ST SYNC SEP
1/2 12AU7 NOISE GATE
1/2 12AU7 2ND SYNC SEP
PL-100
COLOR CODE
BK BLACK R RED
W WHITE OR ORANGE
BL BLUE GN GREEN
BR BROWN Y YELLOW
NOTES
RESISTOR VALUES ARE IN OHMS, ½ WATT, AND CONDENSER VALUES ARE IN µµF. 600V. UNLESS OTHERWISE INDICATED.
K=1000 OHMS M=1,000,000 OHMS @=LESS THAN ONE OHM
VOLTAGES MEASURED WITH A 20,000-OHMS-PER-VOLT METER. RANGE OF VOLTAGES INDICATES MAXIMUM VARIATION WITH CONTROL SETTING.
*SIGNAL PATHS ARE SHOWN BY HEAVY CONNECTING LINES.
PHILCO MODELS 52-T2145X(Code 125), 52-T2182(Code 121), 52-T2182L(Code 121)
PL 100 (PIN VIEW)

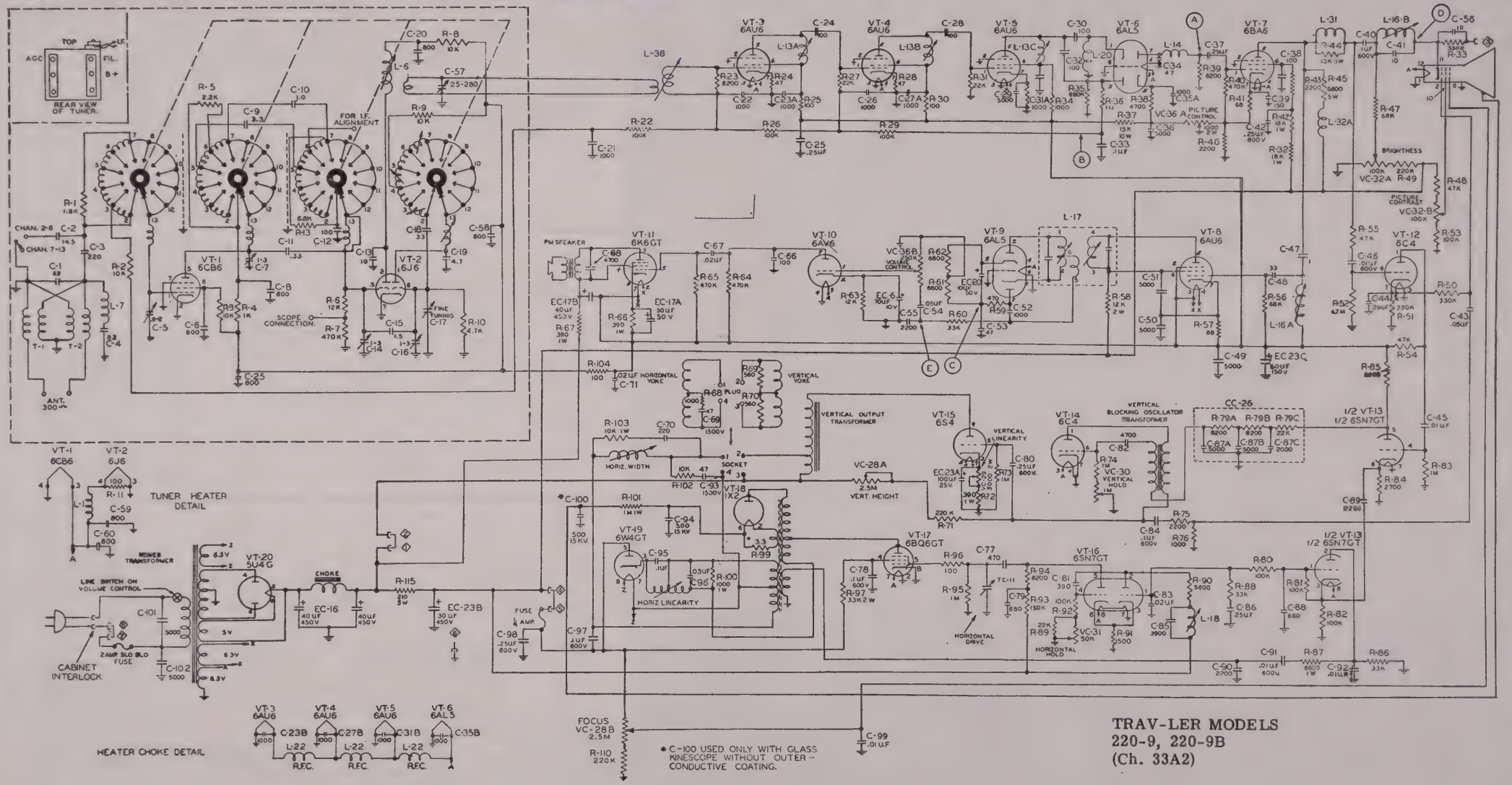


Philco AM Radio RT-6



Philco Deflection Chassis D-4

L. F. E.
3224 MEADE
DENVER, COLORADO



TRAV-LER MODELS
220-9, 220-9B
(Ch. 33A2)

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PRELIMINARY DATA
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SET 159 FOLDER 2A

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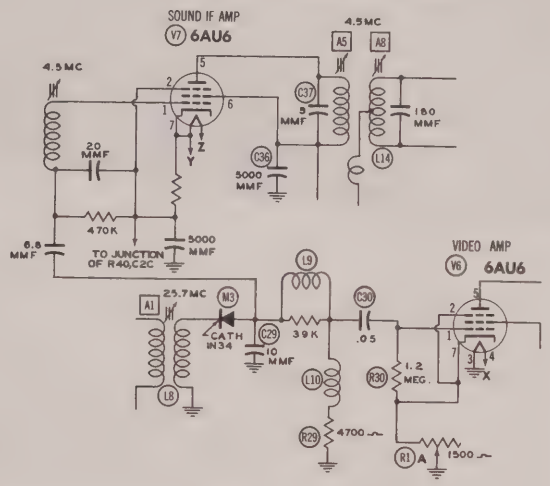
SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 116

MODEL	CHASSIS	PICTURE TUBE	CHASSIS
1750	TV17A3A	17" Rect.	Table Model
1751	TV17A3A	17" Rect.	Table Model
1752	TV17A3A	17" Rect.	Consolette
2053	TV17A7	20" Rect.	Consolette
2054	TV17A7	20" Rect.	Console Comb.
2055	TV17A7	20" Rect.	Table Model
2056	TV17A7	20" Rect.	Consolette

The above Muntz television receivers are electrically identical to Models M31, M32 and M33 covered in Photofact Folder 10 In Set 116 except for the following:

L17 and C27, used for providing line antenna coupling to the tuner input, were removed.

The 4.5MC sound take off circuit was revised. A partial schematic below shows the new circuit.



L11 was connected directly to Pin 5 of the video amplifier V6.

C30 video coupling capacitor was changed to .1MFD.

R36 ratio detector diode load, was changed to 10K.

The AGC line was removed from the junction of R28 and R32 and reconnected to the opposite end of R32. The junction of R28 and R32 now became test point A .

The dual triode vertical oscillator and output tube, V11, was changed to a type 6BL7GT. Connections to the tube socket remained the same.

R43, picture tube grid resistor, was changed to 9.1KΩ.

R58, voltage divider resistor connected to vertical size control was removed.

An 8.2KΩ 2W resistor was added in parallel with R59, B+ decoupling resistor for vertical deflection circuit.

R71, horizontal oscillator plate load resistor, was changed to 68KΩ.

C4, connected to the red lead of the deflection yoke was changed to .47MFD.

Capacitors C63, C64 and C65 in the horizontal deflection circuit were removed from the +340VDC

CONTINUED ON REVERSE SIDE

MUNTZ MODELS 1750, 1751, 1752 (Ch. 17A3A), 2053, 2054, 2055, 2056 (Ch. 17A7).

PRODUCTION CHANGES
BULLETIN 33

PRODUCTION CHANGES
BULLETIN 33

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line and connected to the line to the red lead of the deflection yoke.

A 32KΩ 10W resistor was added between ground and the red lead of the deflection yoke.

Receivers employing 20" picture tubes have a 500MMF@ 20KV high voltage filter capacitor connected from ground to Pin 7 of the HV rectifier tube.

Chassis 17A7 employing either a type 20CP4 or 20HP4 electrostatically focused picture tube have an additional circuit for providing focusing voltage. A 2Meg potentiometer part number VC-0034 was connected as a bleeder for the B+ boost voltage Pin 3 of the damper tube to ground. A 100KΩ resistor was then connected between the arm of the focuse control and Pin 6 of the picture tube. A .005MFD capacitor was connected from Pin 6 of the picture tube to +340VDC line.

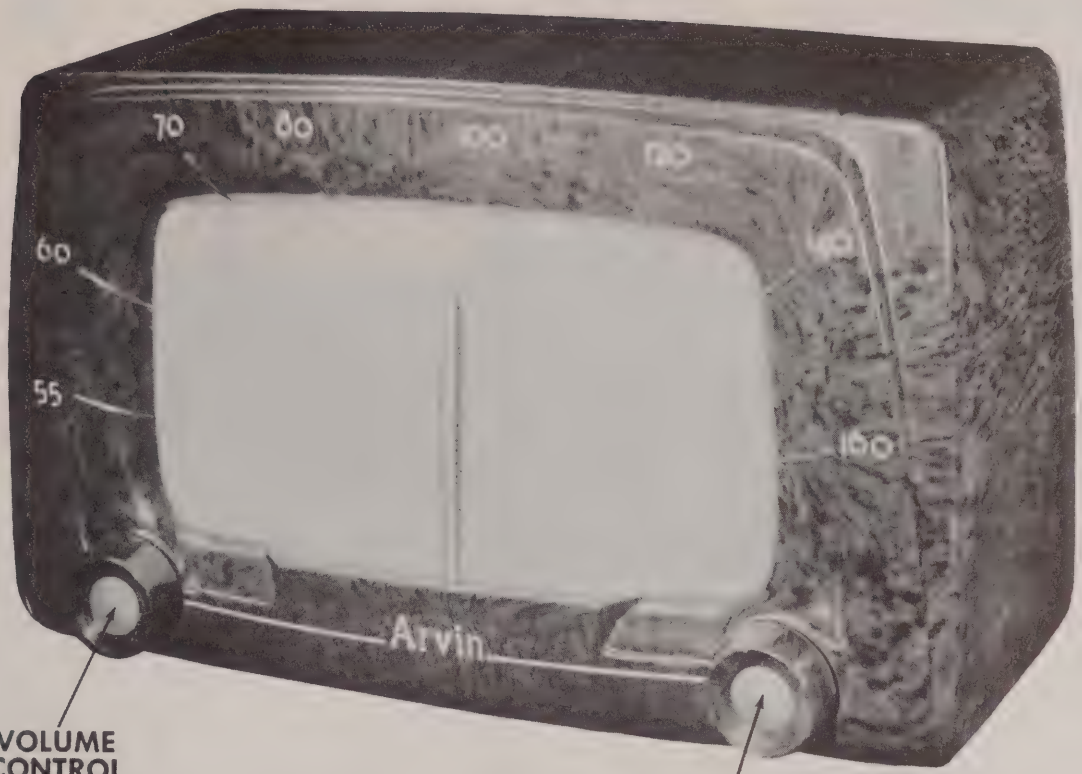
A filter choke part #LC-0059-1 was connected in place of the focus coil.

R7, R78 and R80 were removed.

The following list of components applies to the new Models.

T3	Horizontal Output Transformer (for 20" rectangular picture tube)	TO-0028 or TO-0029
T4	Vertical Output Transformer	TO-0027 or TO-0032
T5	Deflection Yoke	LC-0056
L13	4.5MC Sound Take-Off	LO-0038
L14	Ratio Detector Transformer	LI-0046
V11	Vertical Osc. and Vertical Output	6BL7GT
V17	20" Rectangular Picture Tube	20CP4 or 20DP4A
	Centering Magnet	PR-0180

ARVIN
MODEL 553 (Ch. RE-308)



ARVIN
MODEL 553 (Ch. RE-308)

TRADE NAME	Arvin Model 553 (Ch. RE-308)
MANUFACTURER	Arvin Industries, Inc. Columbus, Ind.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 or 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiveris in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator on rear section of tuning gang. Low to B -.	455KC (400~mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.	Loop	1700KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	.	Loop	1400KC	Tune for max. output.	"	A6	"

DENVER, COLORADO
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3A	Det.AVC-AF Amp.	12AT6	12AT6	7BT	
B	Det.AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rect.	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	150	A24537	PRS150/80-40		EDL8415		TVA-3455	Filter (Red)
B	50	150							" (Blue)
C2	.05	200	C20067-503	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3	250	500	C20065-251	1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	Diode RF Filter
C4	.01	400	C20068-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C5A	.01		♦ A24084		♦ PC-80				Audio Coupling
B	250								AF Amp. Plate
C									Audio Output Grid
C6	.01	400	C20068-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Output Plate
C7	.05	200	C20067-503	P288-05	DF-503	PTE4S5		2TM-S5	Tone Comp.
C8	.05	400	C20068-503	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C9	.05	400	C20068-503	P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

♦ Items C5A, C5B, C5C, R8A, R8B are combined in one unit.
When replacing seperately, C5B and C5C should total 250MMF

CONTROLS

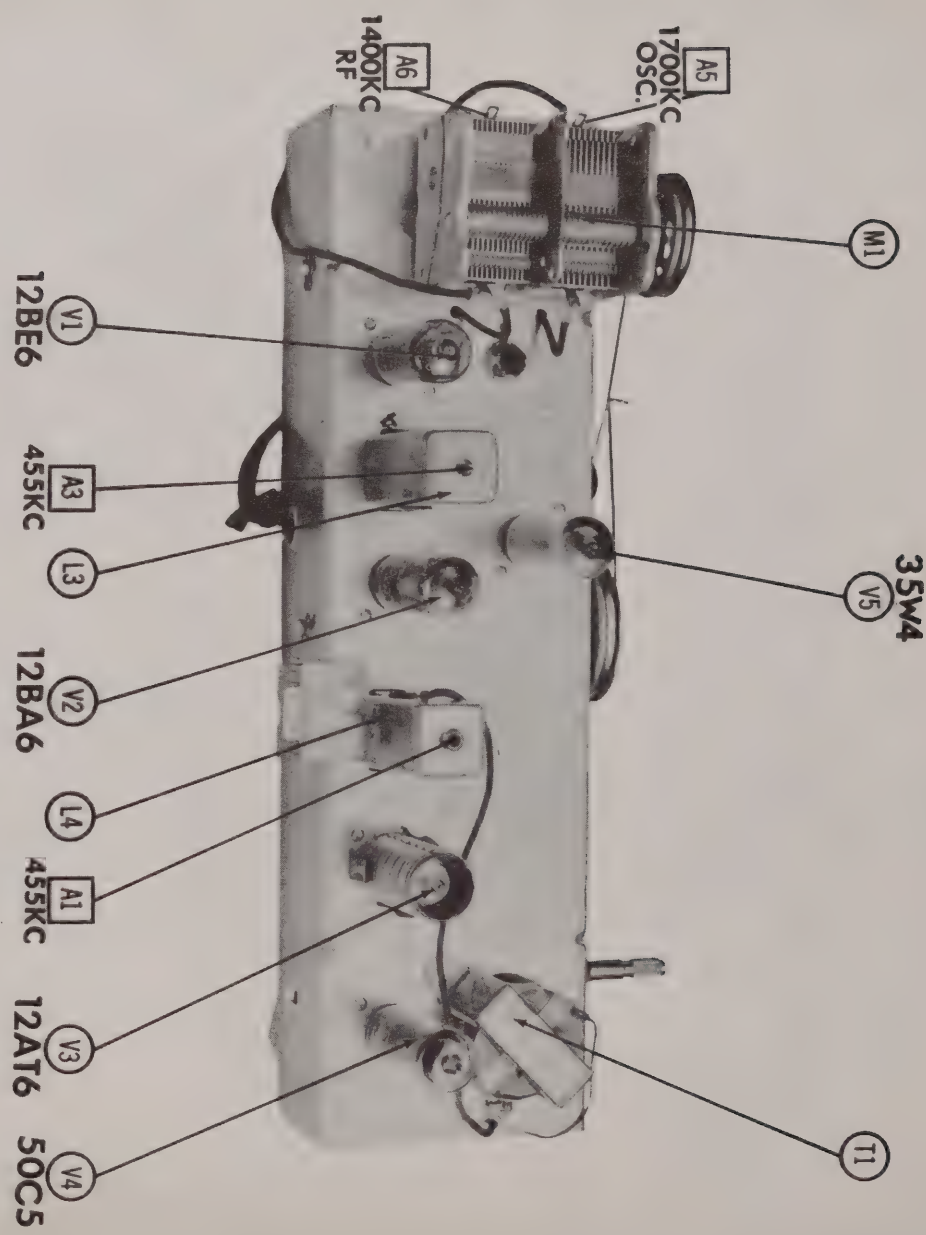
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	1Meg	½	C24515	Q13-137	AG-63-Z	AN-70	Volume Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	
R2	22KΩ 20%	1/4	C20060-223	BTS-22K	Oscillator Grid
R3	47Ω 20%	1/4	C20060-470		IF Amplifier Cathode
R4	2.2Meg 20%	1/4	C20060-225	BTS-2.2Meg	AVC Network
R5	470Ω 20%	1/4	C20060-471	BTS-470	Tone Compensator
R6	22KΩ 20%	½	C20060-223	BTS-22K	Tone Compensator - See Note 1
R7	4.7Meg 20%	1/4	C20060-475	BTS-4.7Meg	AF Amplifier Grid
R8A	500KΩ	½	♦ A24084	BTS-470K	AF Amplifier Plate
B	500KΩ	½		BTS-470K	Output Grid
R9	120Ω	½	C20120-121	BTS-120	Output Cathode
R10	1200Ω	1	C20070-122	BTA-1200	Filter
R11	15Ω 20%	1/4	C20060-150		Surge Limiter
R12	330KΩ 20%	1/4	C20060-334	BTS-330K	Line Isolation

Note 1. Some models may use a 2200Ω resistor in this application.
♦ Items R8A, R8B, C5A, C5B, and C5C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.3KΩ	3.4Ω	180Ω	.5Ω	AC24542	A-3332	A-3025	RO-2 ①	① Drill one new mounting hole

SPEAKER

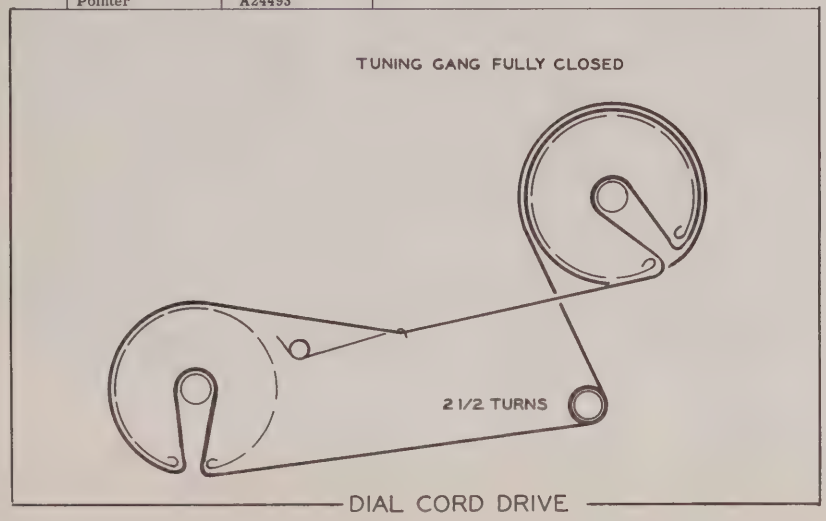
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	ARVIN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.4Ω	C24513	ST-113 Mod. P4-X	4A1	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ARVIN PART No.	MERIT PART No.	
L1	Loop Ant.	3.4Ω		D24514		
L2	Osc. Coil	.5Ω	6.5Ω	AC24210-1		
L3	Input IF	15.5Ω	13.5Ω	C21797-16		
L4	Output IF	21Ω	21Ω	C21797-16		

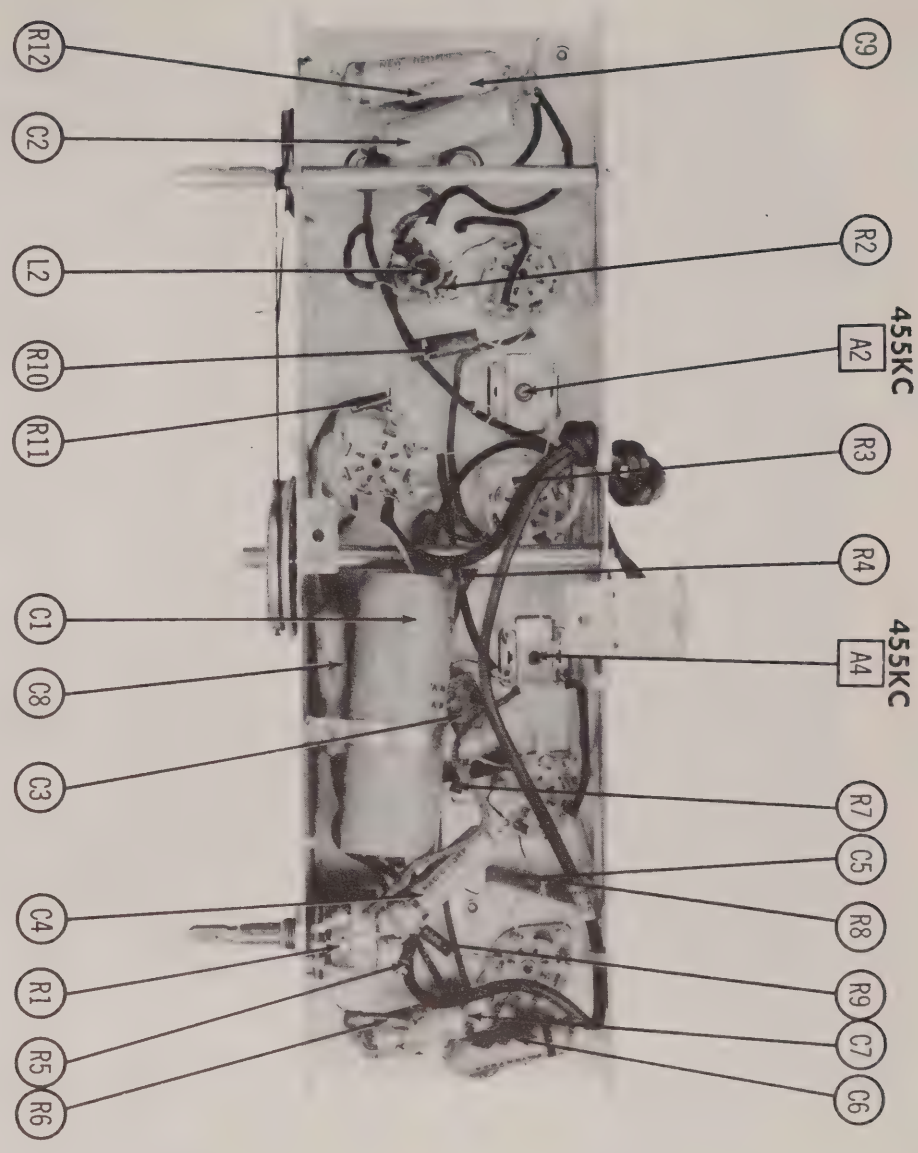
MISCELLANEOUS

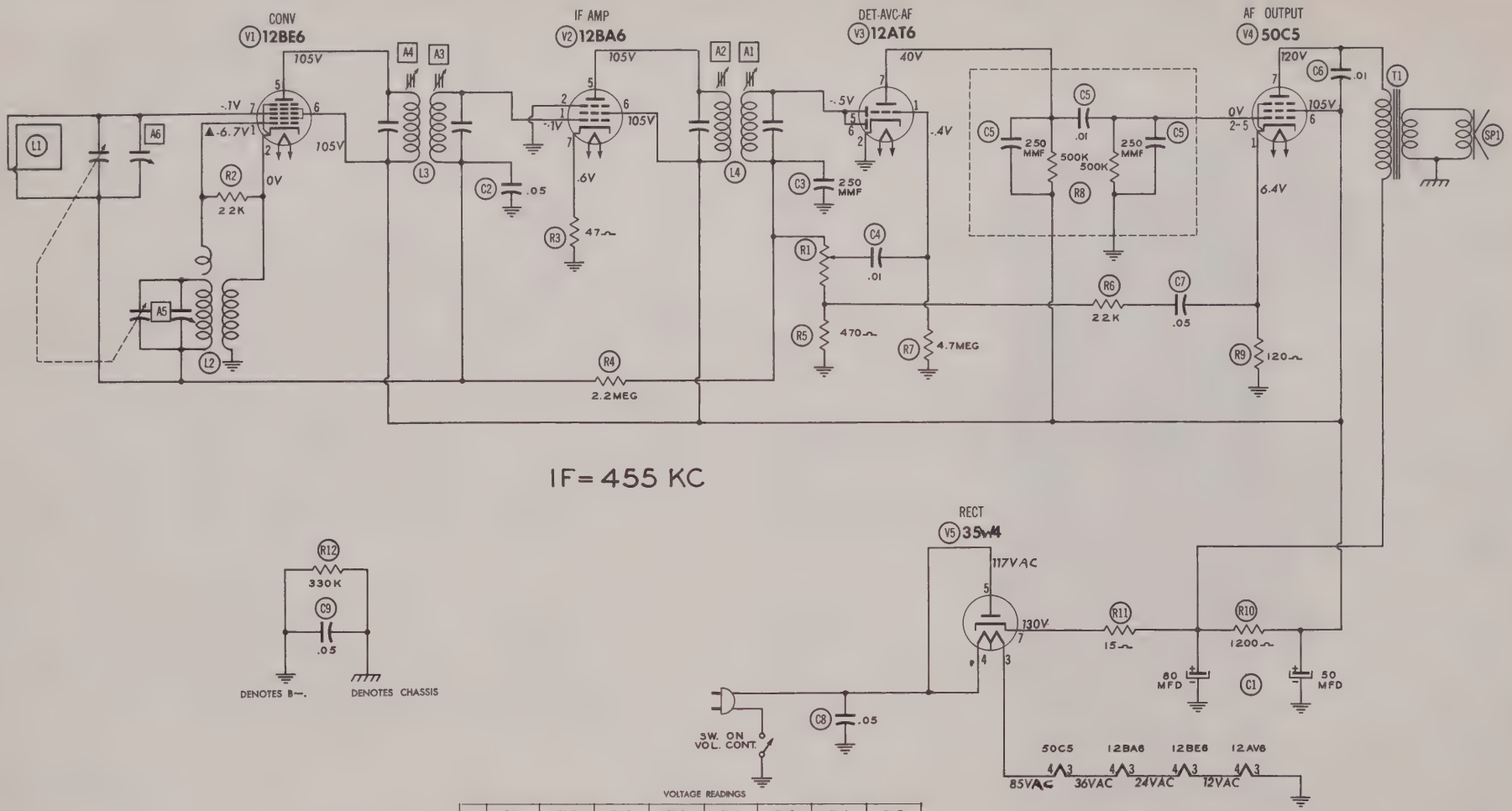
ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	2 Gang Var. Cap.	C241516	(24-464MMF, 28-180MMF)
	Cabinet	R24491-1	Walnut
	Knob	A24492-4	
	Pointer	A24493	



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	3.2Meg
V 2	12BA6	3.3Meg	0Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	47Ω
V 3	12AT6	4.7Meg	0Ω	0Ω	12Ω	1Meg	1Meg	†500KΩ
V 4	50C5	120Ω	500KΩ	36Ω	86Ω	500KΩ	†1.2KΩ	†195Ω
V 5	35W4	†15Ω	3.3Meg	86Ω	121Ω	121Ω	110Ω	70KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5

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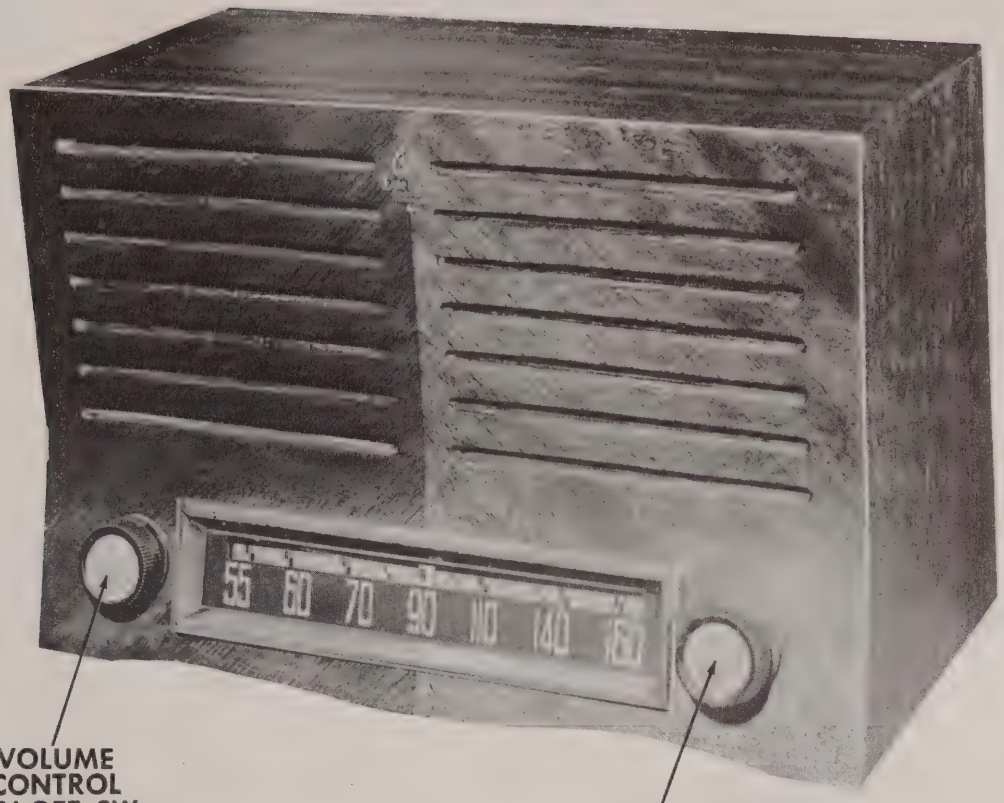
159-4

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

EMERSON MODELS
653B, 702B (Ch. 120136-B)



EMERSON MODELS
653B, 702B (Ch. 120136-B)

EMERSON MODEL 702B

TRADE NAME	Emerson Models 653B, 702B (Ch. 120136-B)
MANUFACTURER	Emerson Radio and Phonograph Corp., 111 Eighth Ave., New York, 11, N.Y.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (Five)	Types 12SA7 Conv., 12SK7 IF Amp., 12SQ7 Det.-AVC-AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC/DC — RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer to the last dot at the left hand end of the dial backplate. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400~mod)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 702B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		EMERSON PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8R	
V2	IF Amp.	12SK7	12SK7	8N	
V3	Det. -AVC-AF Amp.	12SQ7	12SQ7	8Q	
V4	Audio Output	50L6GT	50L6GT	7AC	
V5	Rect.	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	30	150	925000	PRS150/50-30		BRD5315A		TVA-2450	Filter (Red)
B	50	150							Filter (Green)
C2	.05	400	920539	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3A	220		♦923023	SI220	D6-221	5W5T25	GP2K-221	♦34C3	Diode RF Filter
B	.002			P688-002	D6-202	PTE6D2	GP2-333-202		Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-221		AF Amp. Plate
D	.005			P688-005	D6-502	PTE6D5	GP2-333-502		Audio Coupling
C4	.05	400	920539	P488-05	DF-503	PTE4S5		4TM-S5	Audio Output Plate †
C5	.05	400	920539	P488-05	DF-503	PTE4S5		4TM-S5	Rectifier Plate
C6	.1	200	920040	P288-1	DF-104	PTE4P1		2TM-P1	Line Isolation

† Some models use .02MFD in this application (Part No. 920540).
♦ Items C3A, C3B, C3C, C3D are combined in one unit.

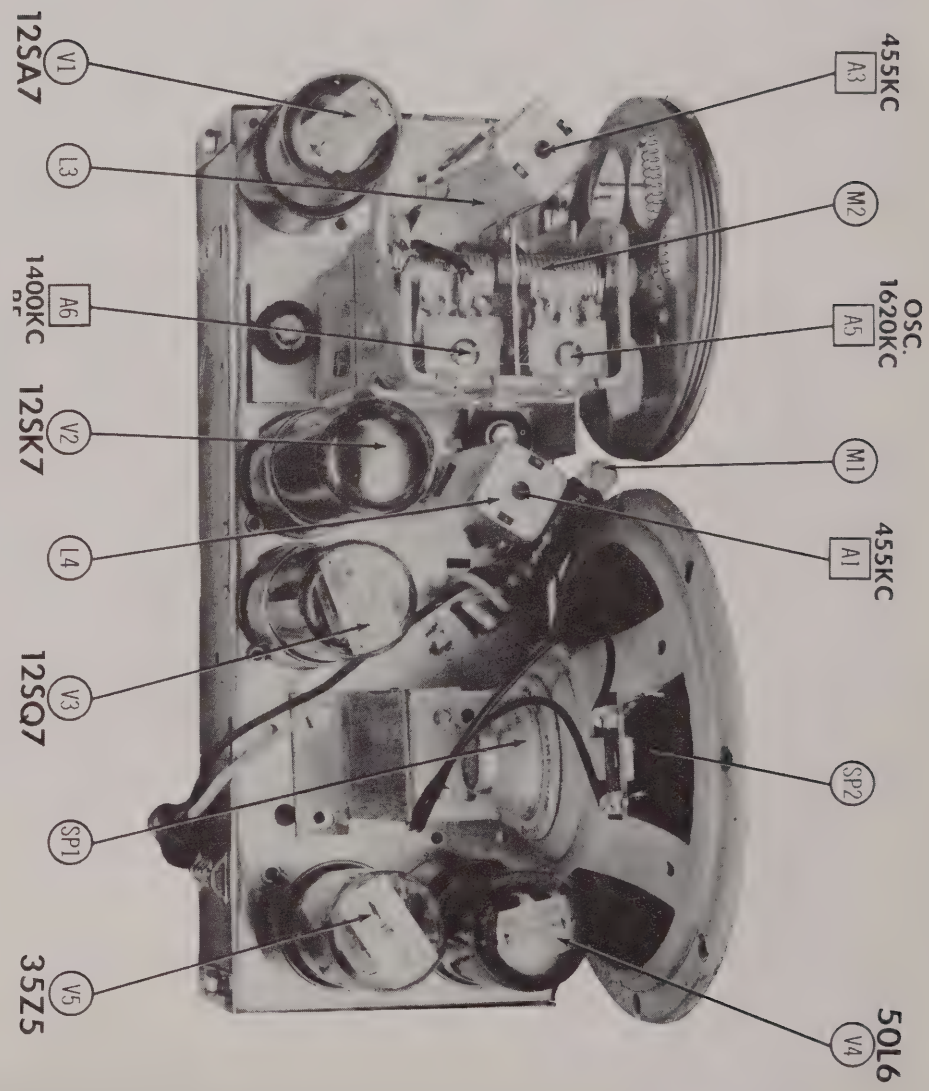
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	390145	Q11-133	AG-58-S	SB-212-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	Osc. Grid
R3	3.3Meg	½		BTS-3.3Meg	AVC Network
R4	10Meg	½		BTS-10Meg	AF Amp. Grid
R5	470KΩ	½		BTS-470K	AF Amp. Plate
R6	470KΩ	½		BTS-470K	Output Grid
R7	150Ω	½		BTS-150	Output Cathode
R8	1500Ω	1		BW-1-1500	Filter
R9	18Ω	½			Rectifier Ballast
R10	220KΩ	½		BTS-220K	Isolation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2KΩ	3.2Ω	200Ω	.9Ω	734057	A-3332	A-3025	R0-2 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P.M.	3.2Ω	180045	ST-113 Mod. P4-X	5A07	
	CONE DIA.	V. C. DIA.				
SP2	4 7/8 In.	9/16 in.				

COILS (RF-IF)

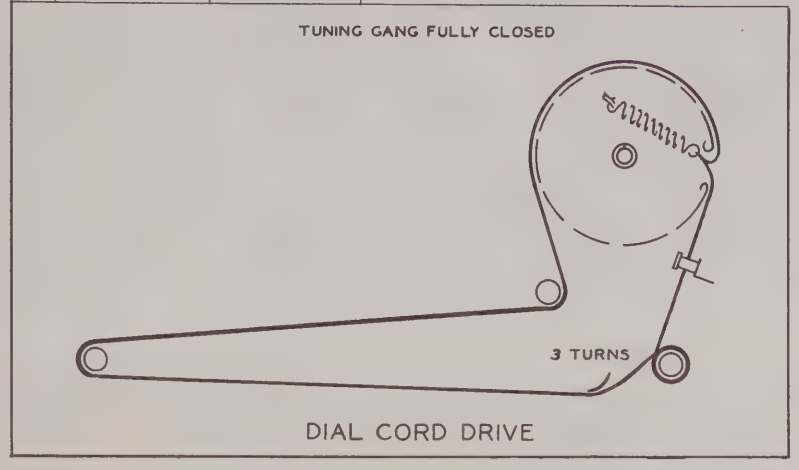
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.	MERIT PART No.	
L1	Loop Ant.	3.3Ω		700063		
L2	Osc. Coil	.5Ω	6.4Ω	716026-2		
L3	Input IF	19Ω	19.5Ω	720525		
L4	Output IF	21Ω	21Ω	720021		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					EMERSON PART No.		
M1	Bayonet	6-8	.15	Brown	807000	807000	Type No. 47

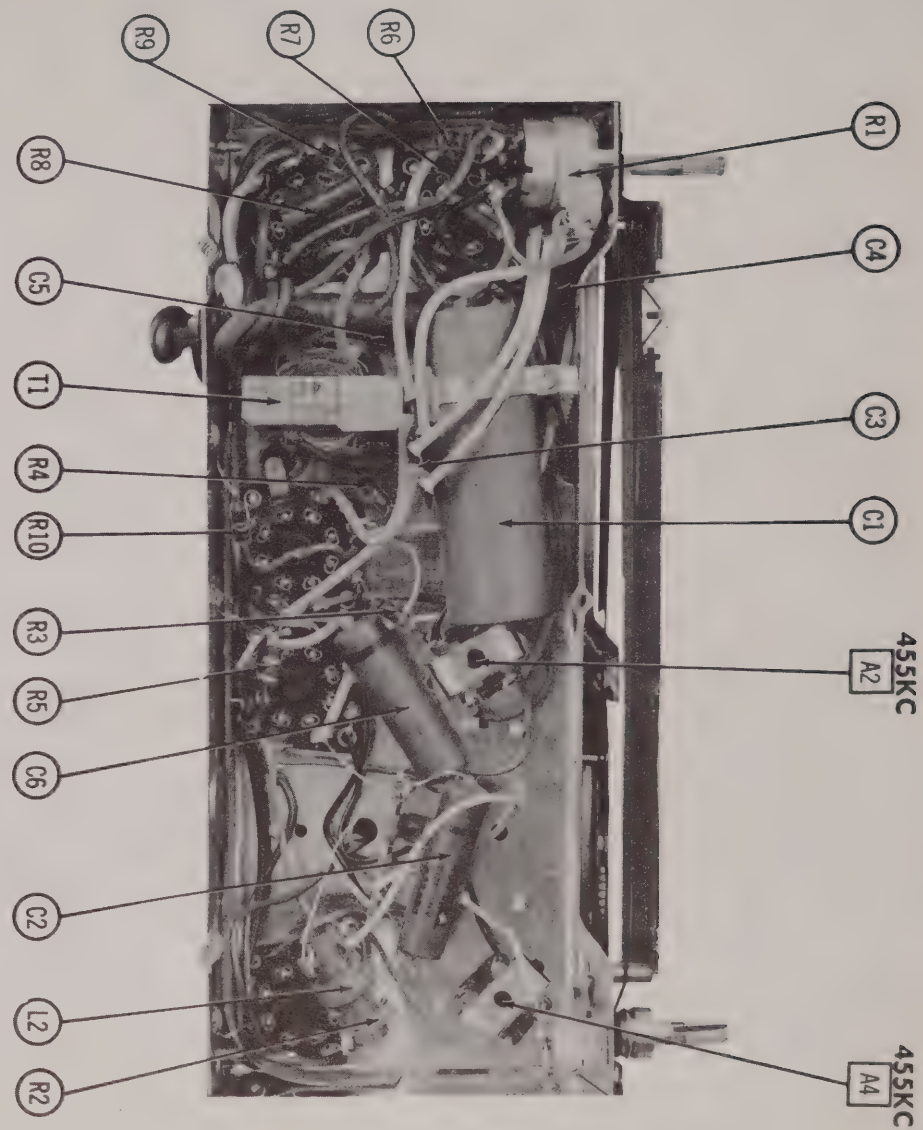
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M2	2 Gang Var. Cap.	900071	(21-390MMF, 26-180MMF)
	Cabinet	140345	Bakelite-Walnut (653B)
	Cabinet	140377	Urea-Ivory (653B)
	Cabinet	140435	Wood (Model 702B)
	Pointer	525022-2	
	Knob	460162S	

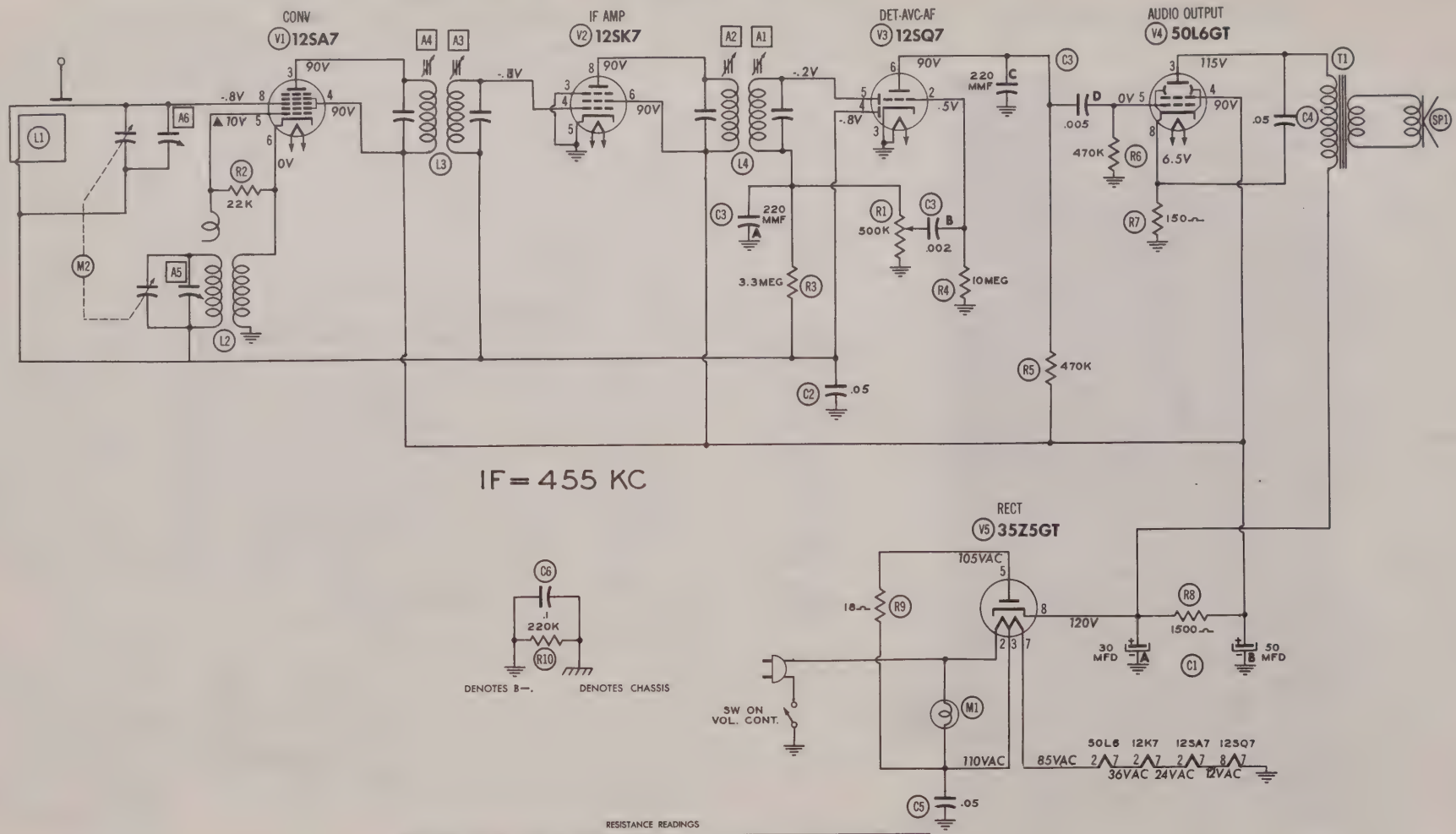


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



EMERSON MODEL 702B



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	¶0Ω	24Ω	†1.5KΩ	†1.5KΩ	22KΩ	.6Ω	12Ω	3.8Meg
V 2	12SK7	¶0Ω	36Ω	0Ω	3.8Meg	0Ω	†1.5KΩ	24Ω	†1.5KΩ
V 3	12SQ7	¶0Ω	10Meg	0Ω	3.8Meg	500KΩ	†470KΩ	0Ω	12Ω
V 4	50L6GT	INF	86Ω	†200Ω	†1.5KΩ	470KΩ	470KΩ	36Ω	150Ω
V 5	35Z5GT	INF	121Ω	110Ω	INF	128Ω	INF	86Ω	140KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V5
¶ MEASURED FROM CHASSIS

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

HOFFMAN MODELS
24B707, 24M708 (Ch. 187, B, C)

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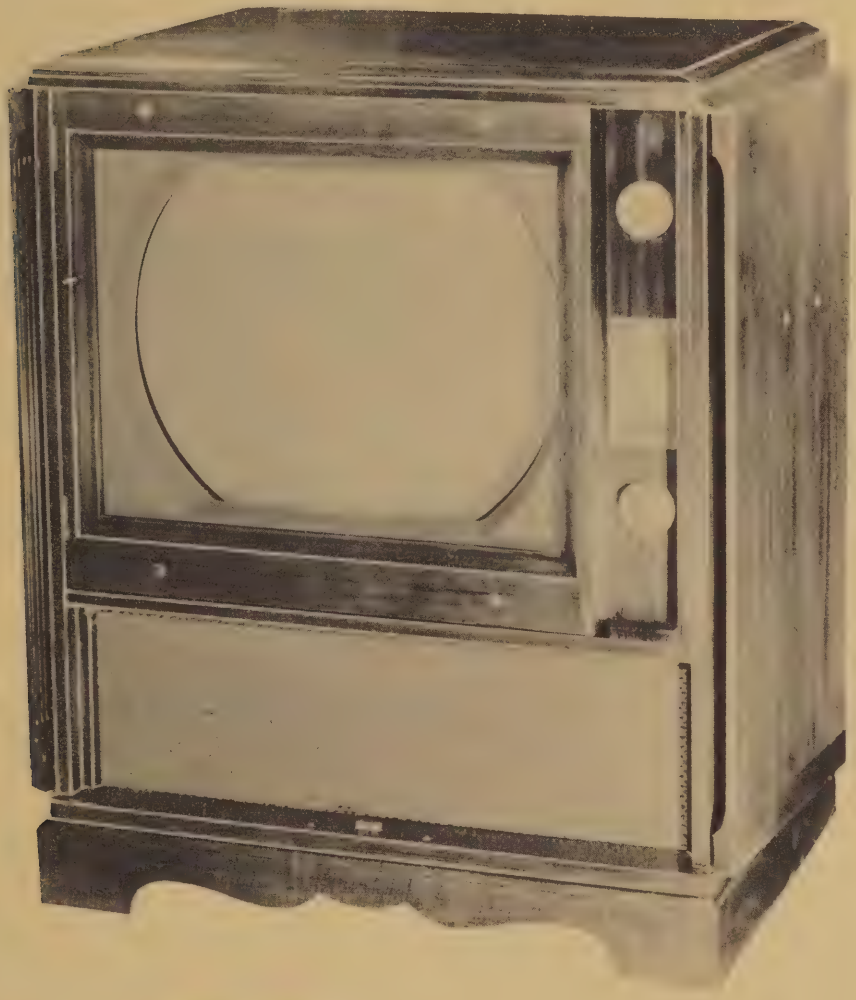

MODEL 24M708

PROPERTY OF
E. E. BLANKENSHIP
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DENVER, COLORADO

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HOFFMAN MODELS
24B707, 24M708 (Ch. 187, B, C)

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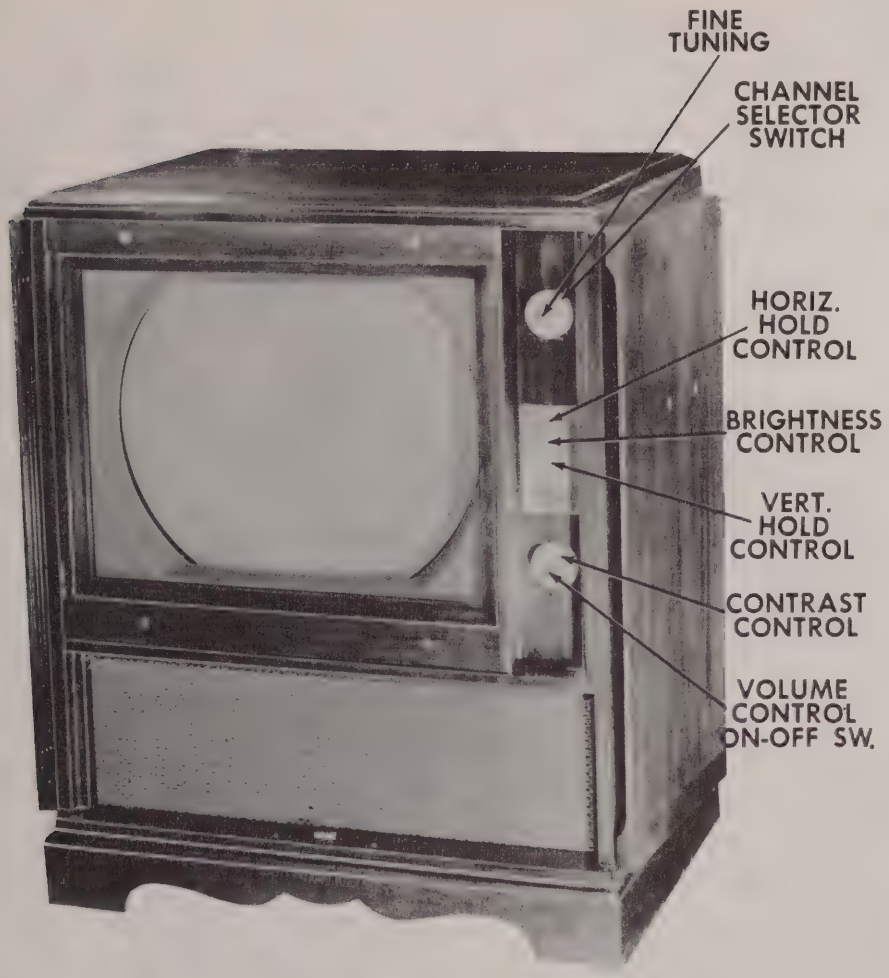

L. F
DENVER COLORADO

HOFFMAN MODELS
24B707, 24M708 (Ch. 187, B, C)

HOFFMAN 24M708

TRADE NAME	Hoffman Models 24B707, 24M708, (Chassis 187, B, C)
MANUFACTURER	Hoffman Radio Corp., 3761 S. Hill St., Los Angeles, Calif.
TYPE SET	Television Receiver.
TUBES	Twenty Three
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 2.0 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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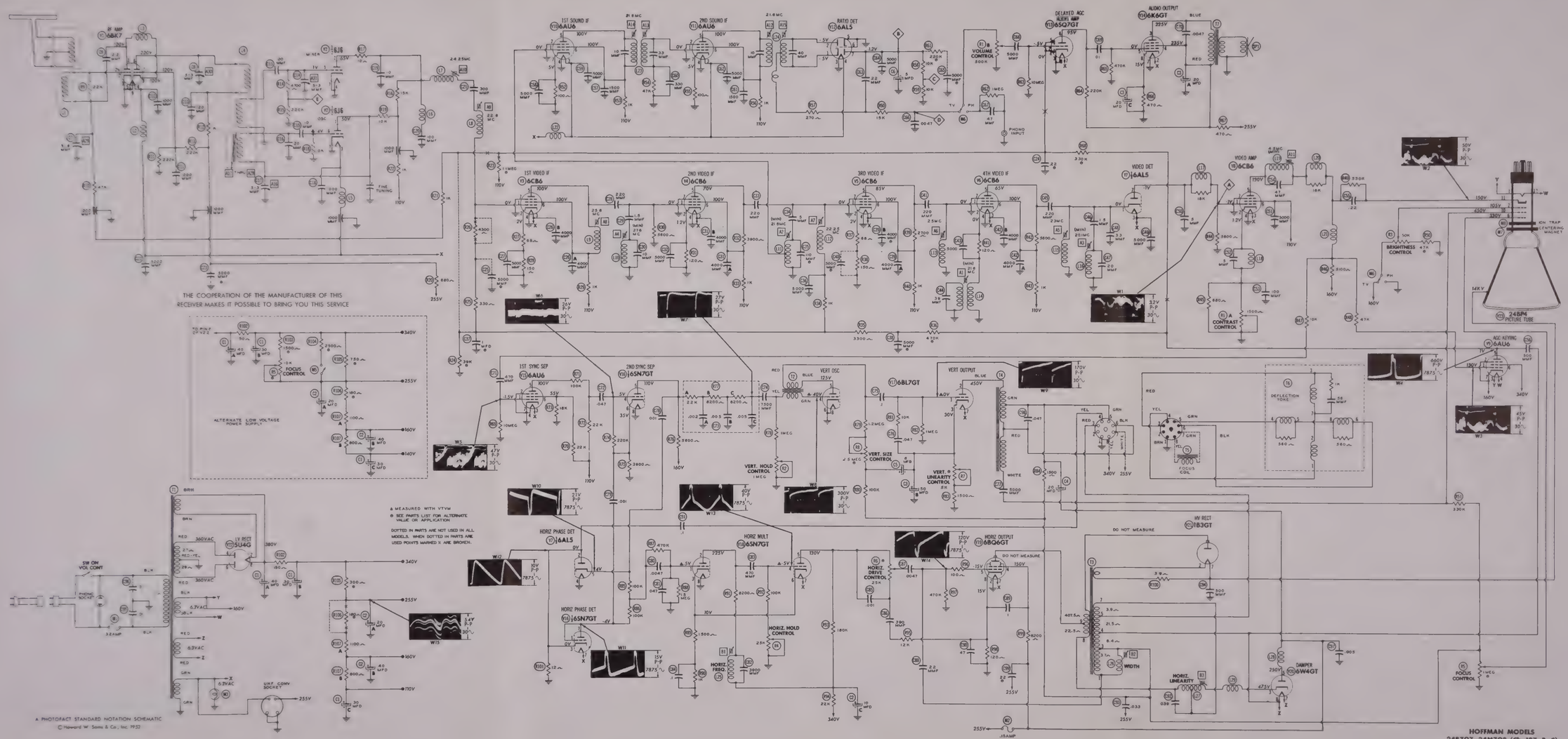
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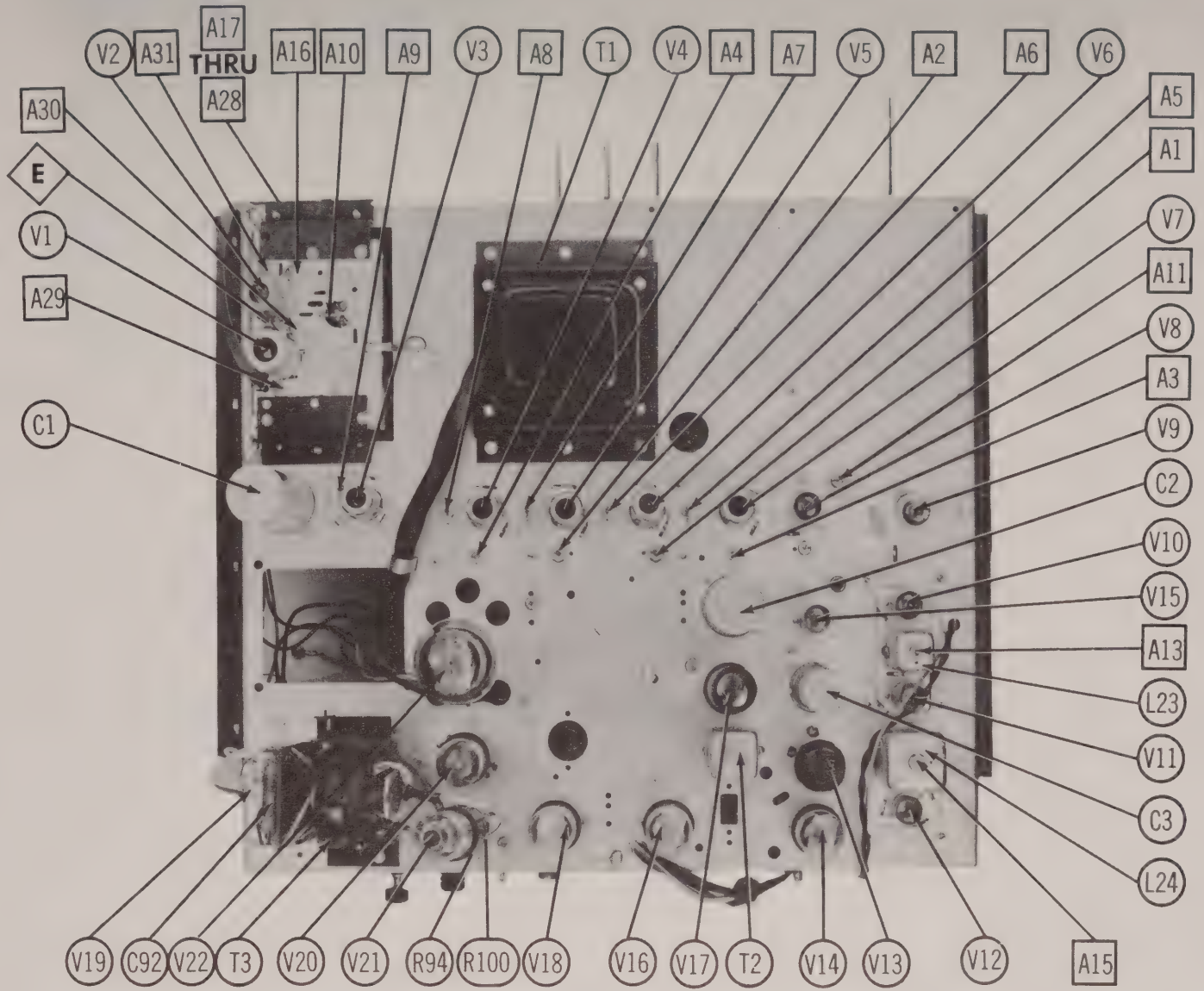
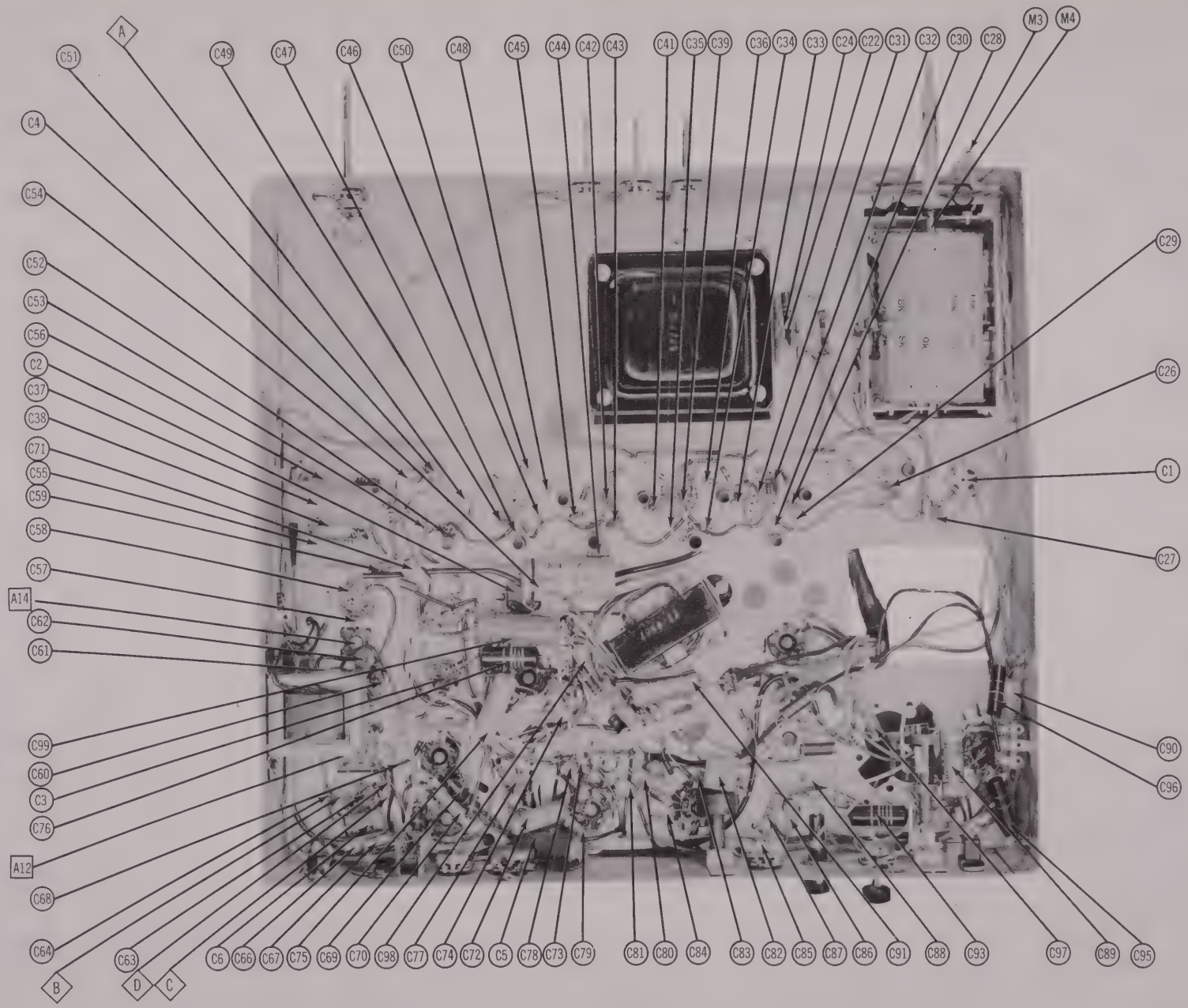


CHASSIS TOP VIEW

HOFFMAN MODELS
24B707, 24M708 (Ch. 187, B, C)



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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TOP VIEW

BOTTOM VIEW

TUBE PLACEMENT CHART

HOFFMAN MODELS
24B707, 24M708 (Ch. 187, B, C)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V18), from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungounded lead of C37, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	21.6MC (unmod)	Any	DC probe to point (A). Common to chassis.	A1, A2	Adjust for MINIMUM deflection. Detune A1 by placing finger on coil while adjusting A2.
2.	"	"	20.1MC	"	"	A3	Adjust for MINIMUM deflection.
3.	"	"	27.6MC	"	"	A4	"
4.	"	"	23MC	"	"	A5	Adjust for maximum deflection. Attenuate signal gen. to maintain 1 volt reading.
5.	"	"	25MC	"	"	A6	"
6.	"	"	22.25MC	"	"	A7	"
7.	"	"	25.8MC	"	"	A8	"
8.	"	"	22.6MC	"	"	A9	Detune A10. Adjust for maximum deflection.
9.	"	"	24.25MC	"	"	A10	Adjust for maximum deflection. Repeat steps 1 thru 9 until no further improvement can be made.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25MC (10MC swp.)	21.6MC 26.1MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curves similar to Fig. 1. If necessary retouch A4 thru A10 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11	.005MFD	High side to pin 1, (grid) of 6CB6, (V8). Low side to chassis.	4.5MC (unmod)	Any	DC probe thru detector (fig. 3) to cathode of picture tube. Common to chassis.	A11	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.005MFD	High side to pin 1, (grid) of 6AU6, (V10). Low side to chassis.	21.6MC (unmod)	Any	DC probe to point (B). Common to chassis.	A12, A13 A14	Adjust for maximum deflection.
13.	"	"	"	"	DC probe to point (C). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12	.005MFD	High side to Pin 1, (grid) of 6CB6 (V10). Low side to chassis.	21.6MC (450KC swp.)	21.6MC	Any	Vert. amp. to Point (B). Low side to chassis.	A12, A13 A14	Disconnect stabilizor capacitor C6. Adjust for maximum amplitude and symmetry as per Fig. 3.
13.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A15	Reconnect stabilizor capacitor C6. Adjust A15 so 21.6MC occurs at center of crossover lines as per Fig. 4. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

The sound IF section must be aligned properly before attempting oscillator alignment.
Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A16. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel.
If adjustment of A16 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
14	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (unmod.)	13	DC probe to Point (C). Common to Point (D).	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A18	
			203.75MC	11		A19	
			197.75MC	10		A20	
			191.75MC	9		A21	
			185.75MC	8		A22	
			179.75MC	7		A23	
			87.75MC	6		A24	
			81.75MC	5		A25	
			71.75MC	4		A26	
			65.75MC	3		A27	
			59.75MC	2		A28	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT TUNERS RF6, RF7, RF8

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E) Low side to chassis.	A29, A30 A31	Adjust for response curve similar to fig. 5 with markers above 90%.
16	"	"	213.MC (10MC Swp)	211.25MC 215.75MC	13	"		Check all channels for response curve similar to fig. 5. If markers fall below 70% on any channel, make compromise adjustment of A29 A30 and A31. with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 179.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC swp))	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

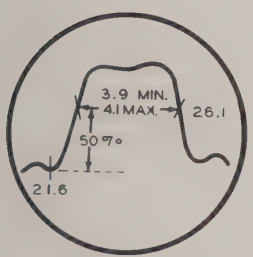


FIG. 1

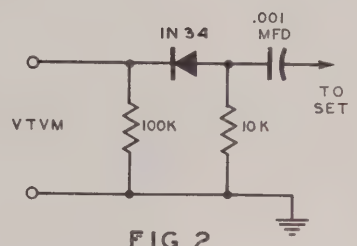


FIG. 2

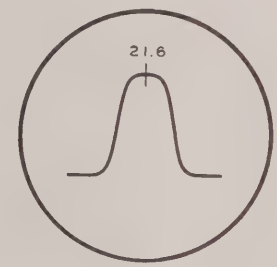


FIG. 3

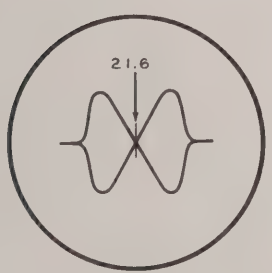


FIG. 4

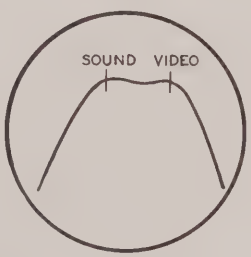
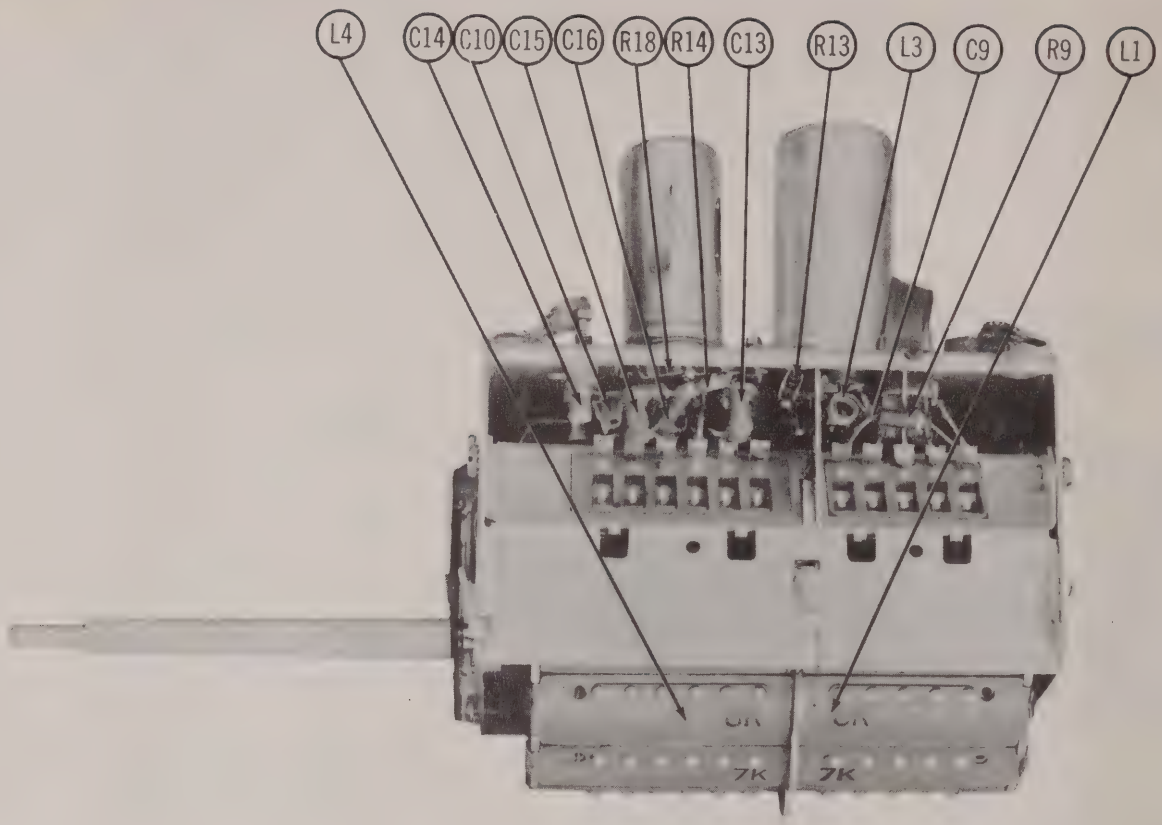


FIG. 5

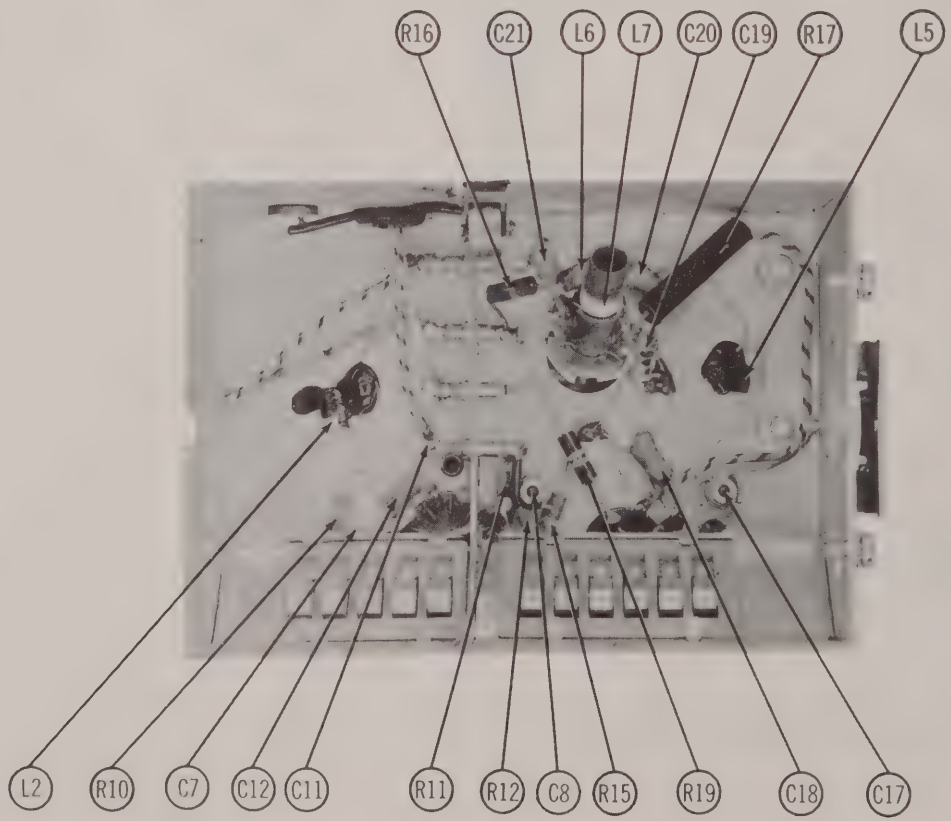
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	Inf.	500KΩ	0Ω	.1Ω	0Ω	†2.1KΩ	110KΩ	Inf.	0Ω
V 2	6J6	†13KΩ	†17KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	43KΩ	218Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 4	6CB6	5.6KΩ	120Ω	.1Ω	0Ω	†7.4KΩ	†3.5KΩ	0Ω		
V 5	6CB6	40KΩ	218Ω	.1Ω	0Ω	†6.2KΩ	†3.5KΩ	0Ω		
V 6	6CB6	.3Ω	120Ω	.1Ω	0Ω	†9.1KΩ	†3.5KΩ	0Ω		
V 7	6AL5	.3Ω	12Ω	.1Ω	0Ω	2.1Meg	0Ω	5.6KΩ		
V 8	6CB6	5.6KΩ	200Ω	.1Ω	0Ω	†6.8KΩ	†2.5KΩ	0Ω		
V 9	6AU6	†53KΩ	†1.7KΩ	■0Ω	■.1Ω	510KΩ	†150Ω	†1.7KΩ		
V 10	6AU6	.1Ω	0Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	100Ω		
V 11	6AU6	47KΩ	0Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	100Ω		
V 12	6AL5	515KΩ	515KΩ	0Ω	.1Ω	0Ω	0Ω	20KΩ		
V 13	6SQ7	0Ω	10Meg	0Ω	500KΩ	500KΩ	†220KΩ	.1Ω	0Ω	
V 14	6K6GT	Inf.	.1Ω	†1.3KΩ	†920Ω	470KΩ	Inf.	0Ω	470Ω	
V 15	6AU6	10Meg	0Ω	.1Ω	0Ω	†125KΩ	12KΩ	0Ω		
V 16	6SN7GT	2.1Meg	2.1Meg	12Ω	220KΩ	†7.3KΩ	3.9KΩ	.1Ω	0Ω	
V 17	6BL7GT	1Meg	#3KΩ	2KΩ	1.6Meg	#2.4Meg	0Ω	.1Ω	0Ω	
V 18	6SN7GT	1.5Meg	†30KΩ	2.5KΩ	110KΩ	†200KΩ	2.5KΩ	.1Ω	0Ω	
V 19	6BQ6GT	120KΩ	.1Ω	470KΩ	†8.3KΩ	470KΩ	12KΩ	0Ω	120Ω	TOP CAP #29Ω
V 20	6W4GT	Inf.	Inf.	250KΩ	Inf.	†450Ω	#0Ω	#25Ω	#25Ω	
V 21	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP #430Ω
V 22	5U4G	Inf.	22KΩ	Inf.	27Ω	Inf.	29Ω	Inf.	22KΩ	
V 23	24BP4	■0Ω	20KΩ	PIN 10 #330KΩ	PIN 11 †330KΩ	PIN12 ■.1Ω	PIN 6 250KΩ			

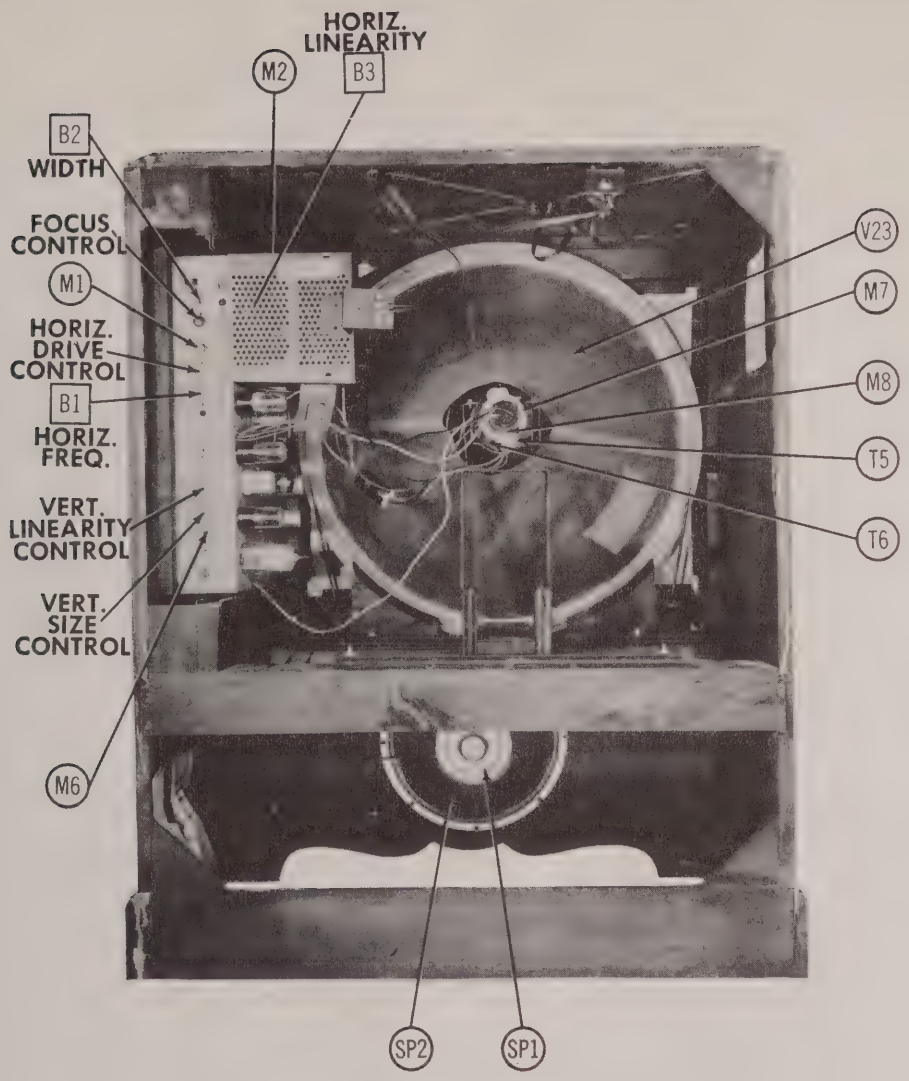
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED.
† MEASURED FROM PIN 8 OF V22.
# MEASURED FROM PIN 3 OF V20.
■ MEASURED FROM 160 VDC LINE.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Turn the horizontal drive control clockwise until a bright vertical line appears in the picture. Then turn the control counter-clockwise just far enough to remove the vertical line.

If the vertical line does not occur leave the control at maximum clockwise.

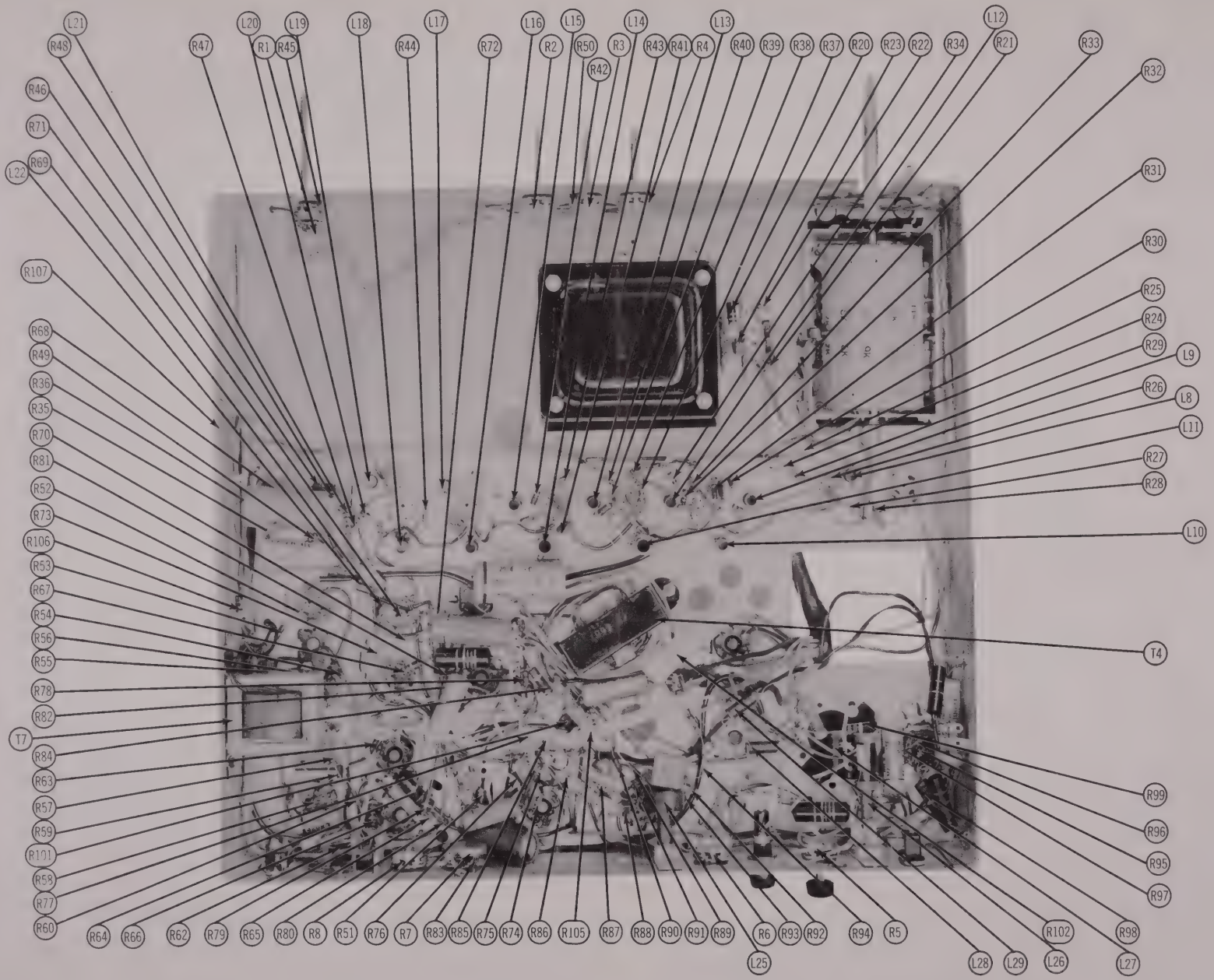
Adjust the width slug, (B2), until the picture is slightly wider than necessary to fill the mask horizontally.

Adjust the horizontal linearity slug, (B3), until the picture is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 9 wood screws and back cover.
2. Remove 6 push on type control knobs.
3. Disconnect Built-in antenna, picture tube, yoke plug, speaker, and HV lead.
4. Remove 3 wood screws and vertical wood strip at rear of chassis. Remove chassis.
5. Remove 4 speaker nuts and speaker.

Note: For picture tube removal it is necessary to remove chassis as outlined above.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BK7	6BK7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	4th Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Det. -Horiz. Phase Det.	6AL5	6AL5	6BT	
V8	Video Amp.	6CB6	6CB6	7CM	
V9	Keyed AGC	6AU6	6AU6	7BK	
V10	1st Sound IF Amp.	6AU6	6AU6	7BK	
V11	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Det.	6AL5	6AL5	6BT	
V13	Audio Amp. -Delayed AGC	6SQ7GT	6SQ7GT	8Q	
V14	Audio Output	6K6GT	6K6GT	7S	
V15	1st Sync. Sep.	6AU6	6AU6	7BK	
V16	2nd Sync. Amp. -Horiz. Phase Det.	6SN7GT	6SN7GT	8BD	
V17	Vert. Osc. -Vert. Output	6BL7GT	6BL7GT	8BD	
V18	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V19	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rect.	1B3GT	1B3GT	3C	
V22	LV Rect.	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: THOMAS PART No.	RTMA BASE TYPE	NOTES
V23	24AP4			12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475	4232	AFH 3-54		UPT44445		TVL-3843	◓ Filter
B	30	475		PRS500/16					▲ Filter
C	30	475							■ Decoupling
C2A	20	450	4228	AFH 4-94		UPT407		TVL-4822	▲ Filter
B	40	475		PRS150/4				TVA-1303	■ Decoupling
C	10	475							◓ Horiz. MV Decoupling
D	5	50							Not used
C3A	20	475	4230	AFH 3-157		UP2045C		TVL-1810	■ Audio Output Dec.
B	50	50		PRS25/10		BR505		TVA-1308	▲ Vert. Output Cathode
C	20	25						TVA-1205	Audio Output Cathode
C4	20	450	4227	PRS450/20		BR2045A		TVA-1709	Vert. Output Dec.
C5	8	500	4241	PRS500/8		BR850A		TVA-1902	Vert. Output Dec.
C6	5	50	4209	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C7	3-9				829-10				Variable Trimmer
C8	.5-3				829-3				Variable Trimmer
C9	2.2				TCZ-2.2		NP0K-2R2		Neutralizing Cap.
C10	120			SI120	D6-121		GP2K-121	5GA-T12	RF Amp. Plate
C11	1000			BPD-001	DD-102		801-001	5HK-D1	RF Amp. Grid
C12	1000			SI1000	D6-102		GP2L-102	5HK-D1	RF Amp. Fil.
C13	100			SI100	D6-101		GP1K-101	5GA-T1	RF Coupling
C14	.5-3				829-3				Variable Trimmer
C15	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Osc. Grid Cap.
C16	20			SI20NP0	TCZ-20		NP0K-200		Fixed Trimmer
C17	.5-3				829-3				Variable Trimmer
C18	1000			SI1000	D6-102		GP2L-102	5HK-D1	Conv. Fil.
C19	10			SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C20	100			SI100N750	TCN-100		N750L-101	5TCU-T1	Fixed Trimmer
C21	300			SI300	D6-301		GP2K-301		IF Coupling
C22	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Fil. Bypass
C23	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass *
C24	.22	200	4131	P488-22		GT2P25		2TM-P22	AGC Filter *
C25	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter *
C26A	4000		4036	BPD-004	D6-402	1D5D4	822-004	5HK-2D4	1st. Video IF Dec.
B	4000				D6-402	1D5D4			1st. Video IF Fil.
C27	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st. Video IF Cathode
C28	220		4026	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	IF Coupling
C29	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5		IF Coupling
C30	10			SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C31A	4000		4036	BPD-2x004	D6-402	1D5D4	822-004	5HK-2D4	2nd. Video IF Dec.
B	4000				D6-402	1D5D4			2nd. Video IF Fil.
C32	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Video IF Cathode
C33	220		4026	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	IF Coupling
C34	5		4081	SI5NP0	TCZ-4.7		NP0K-050		IF Coupling
C35	110				TCZ-110		NP0-333-111		Fixed Trimmer †
C36	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C37	1.0	100	14200	485-1.0		GT2W1		2TM-M1	AGC Filter ‡
C38	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter ‡
C39A	4000		4036	BPD-2X004	D6-402	1D5D4	822-004	5HK-2D4	3rd Video IF Dec. ¶
B	4000				D6-402	1D5D4			3rd Video IF Fil. ¶
C40	5000		4029	BPD-005	DD-502	1D5D5	811-004	5HK-D5	3rd Video IF Cathode *
C41	220		4026	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	IF Coupling
C42A	4000		4036	BPD-2X004	D6-402	1D5D4	822-004	5HK-2D4	4th Video IF Dec.
B	4000				D6-402	1D5D4			4th Video IF Fil.
C43	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th Video IF Cathode
C44	39				TCZ-39		NP0L-390		Fixed Trimmer
C45	220		4026	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	IF Coupling
C46	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5		IF Coupling
C47	20			SI20NP0	TCZ-20		NP0K-200		Fixed Trimmer
C48	3.3		14000	SI3.3NP0	TCZ-3.3		NP0K-3R3		Fixed Trimmer
C49	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Video Det. Fil.
C50	5		4081	SI5NP0	TCZ-4.7		NP0K-050		Video Det. Filter

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Video Amp. Screen
C52	5			SI5NP0	TCZ-4.7		NP0K-050		Fixed Trimmer
C53	100		4079	SI100	D6-101	5WST1	GP1K-101	5GA-T1	Contrast Cont. Shunt
C54	47			SI47NP0	TCZ-47		NP0K-470	5TCC-Q47	Fixed Trimmer
C55	.22	200	4131	P488-22		GT2P25		2TM-P22	Video Coupling
C56	500	1000	4075						Horiz. Feedback
C57	1500		4090	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	1st Sound IF Dec.
C58	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st Sound IF Cathode
C59	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st Sound IF Fil.
C60	330		4010	SI330	D6-331		GP2K-331	5GA-T33	2nd Sound IF Grid
C61	1500		4090	SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	2nd Sound IF Dec.
C62	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Sound IF Fil.
C63	22		14006		TCZ-22		NP0K-220	5TCC-Q22	Balancing Cap.
C64	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C65	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass . *
C66	.0047	400	4127	P88-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	De-emphasis
C67	47	500	4009	1468-00005	D6-470	5W5Q5	GP1K-470	1FM-45	Tone Comp.
C68	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Audio Coupling
C69	.01	600	4105	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C70	.0047	600	4128	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Output Plate
C71	470	500	14009	1468-0005	D6-471	5W5T25	GP2K-471	1FM-35	Sync. Coupling
C72	.047	600	4133	P688-047	DF-503	PTE6S5		6TM-S47	Sync. Coupling
C73A	.002			P688-002		PTE6D2	GP2-333-202		Vert. Integrator Net
B	.005		♦ 9695	P688-005	♦ PC-100	PTE6D5	GP2-333-502	♦ 101C1	Vert. Integrator Net
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net
									Vert. Osc. Grid Cap.
C74	7500	500	4083						Vert. Sweep Coupling
C75	.1	600	4144	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Discharge
C76	.047	600	4141	P688-047	DF-503	PTE6S5		6TM-S47	Vert. Sweep Coupling
C77	5000		4029	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Horiz.MV Feedback
C78	.001	600	14104	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz.MV Cathode
C79	.001	600	14104	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Drive Shunt
C80	.0047	400	4185	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Horiz. Discharge
C81	.047	200	4158	P288-047	DF-503	PTE4S5		2TM-S47	Horiz. Sweep Coupling
C82	3900	500	4085	1464-004		1DR5D4			Horiz. Sync. Coupling
C83	470	500	14009	1469-0005		5R5T5		MS-35	AFC Filter
C84	.1	200	4143	P288-1	DF-104	PTE4P1		2TM-P1	Fixed Trimmer
C85	.001	600	14104	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz.MV Feedback
C86	390	500	14010	1469-0004		5R5T4		MS-34	Horiz.MV Cathode
C87	.0047	600	4128	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Horiz. Drive Shunt
C88	22	1000	14014						Horiz. Discharge
C89	.1	600	4144	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling
C90	.47	200	4173	P288-47		GT2P5		2TM-P47	Horiz. Sweep Coupling
C91	.1	600	14133	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Output Cathode
C92	.039	600	14128						Horiz. Output Screen
C93	.033	600	14127	P688-033					Horiz. Sweep Coupling
C94	500	20000	4056	HV20C	TV3-502				Fixed Trimmer
C95	.01	600	4105	P688-01		PTE6S1		6TM-S1	Damper Plate
C96	.01	600	4105	P688-01		PTE6S1		6TM-S1	Fixed Trimmer
C97	.005	600	4128	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Line Filter
C98	.047	600	4148	P688-047	DF-503	PTE6S5		6TM-S47	Line Filter
C99	.22	600		684-25		GP6P25		6TM-P25	Fixed Trimmer
									RF Bypass *

* Not used in all Models
† Some Models use 130MMF in this application
‡ Some Models use .22MFD in this application
¶ Some Models use 5000MMF in this application
♦ Items C73A, C73B, C73C, R77A, R77B, R77C are combined in one unit.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA HOFFMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	½	4833		RTV-247	SBB-626-S	Contrast Control-Panel
B	500KΩ	½					Volume Control- Rear
R2A	1Meg	½	4855	Q13-137	AG-63-Z	BSK-70	Vertical Hold Control
B	Shaft			Not Req.	KSS-3	Not Req.	Attach to R2A per instructions
R3A	50KΩ	½	4854	Q11-123	AG-64-S		Brightness Control
B	Shaft			Not Req.	KSS-3		Attach to R3A per instructions
R4A	25KΩ	½	4858	Q11-120	AG-40-S	B-26	Horizontal Hold Control
B	Shaft			Not Req.	KSS-3	Not Req.	Attach to R4A per instructions
R5A	1Meg	½	4832-2	Q11-137	AG-61-S	B-69	Focus Control See Note 1.
B	Shaft			Not Req.	KSS-3	Not Req.	Attach to R5A per instructions
R6A	25KΩ	½	4859	Q11-120	AG-40-S	AN-26	Horizontal Drive Control See Note 2.
B	Shaft			Not Req.	FKS-1/4	AK-1	Attach To R6A per instructions
R7A	5000Ω	½	4820	Q11-114	AG-19-S	AN-10	Vertical Linearity Control See Note 3.
B	Shaft			Not Req.	FKS-1/4	AK-1	Attach to R7A per instructions
R8A	2.5Meg	½	4821	Q11-239	AG-84-S	AN-83	Vertical Size Control See Note 4.
B	Shaft			Not Req.	FKS-1/4	AK-1	Attach To R8A per instructions

Note 1. Models using electrostatic focus use a 1Meg control, Part #4852 or a 2Meg control Part# 4864.
Models using electromagnetic focus use a 10KΩ control Part #4848.
Note 2. Some models use Horizontal Drive Control Part #4849.
Note 3. Some models use vertical linearity control Part #4850.
Note 4. Some Models use vertical size control Part #4851

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HOFFMAN PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R9	22KΩ	½	4628		Antenna Coil Shunt
R10	47KΩ 20%	½	4504	BTS-47K	RF Amplifier Grid
R11	220KΩ 20%	½	4500	BTS-220K	RF Amplifier Grid
R12	1000Ω 20%	½	4542	BTS-1000	RF Amplifier Plate Decoupling
R13	220KΩ 20%	½	4500	BTS-220K	Bias Network
R14	4700Ω	½		BTS-4700	Mixer Grid
R15	220KΩ 20%	½	4500	BTS-220K	Mixer Grid
R16	15KΩ 20%	½	4521		Mixer Plate
R17	10Ω	½			Parasitic Suppressor
R18	10KΩ	½	4597	BTS-10K	Oscillator Grid
R19	10KΩ	½	4597		Oscillator Plate

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA HOFFMAN PART No.	IRC PART No.	IDENTIFICATION CODES
R20	680Ω	1	14679	BTA-680	Voltage Dropping
R21	1000Ω 20%	½	4542	BTS-1000	AGC Network
R22	1000Ω 20%	½	4542	BTS-1000	Voltage Dropping
R23	1.1Meg 5%	½	34590		AGC Network See Note 1
R24	39KΩ	½	24636	BTS-39K	AGC Network See Note 2
R25	330Ω 20%	½	4509	BTS-330	AGC Network
R26	4300Ω 5%	½	24553		1st. Video IF Grid
R27	68Ω	½	4593		1st. Video IF Cathode
R28	150Ω 20%	½	4510	BTS-150	1st. Video IF Cathode
R29	1000Ω 20%	½	4542	BTS-1000	1st. Video IF Decoupling
R30	5600Ω 5%	½	4603	BTS-5600 5%	2nd. Video IF Grid
R31	120Ω	½	4546	BTS-120	2nd. Video IF Cathode
R32	3900Ω 5%	½	4654	BTS-3900 5%	2nd. Video IF Plate
R33	1000Ω 20%	½	4542	BTS-1000	2nd. Video IF Decoupling
R34	1000Ω 20%	½	4542	BTS-1000	AGC Network
R35	3300Ω	½	4607	BTS-3300	AGC Network
R36	470KΩ	½	4622	BTS-470K	AGC Network See Note 2
R37	68Ω	½	4593		3rd. Video IF Cathode
R38	150Ω 20%	½	4510	BTS-150	3rd. Video IF Cathode
R39	2700Ω 5%	½	24533	BTS-2700 5%	3rd.Video IF Plate
R40	1000Ω 20%	½	4542	BTS-1000	3rd. Video IF Decoupling
R41	120Ω	½	4546	BTS-120	4th. Video IF Cathode
R42	5600Ω 5%	½	4603	BTS-5600 5%	4th. Video IF Plate
R43	1000Ω 20%	½	4542	BTS-1000	4th. Video IF Decoupling
R44	5600Ω 5%	½	4603	BTS-5600 5%	Video Output Grid
R45	680Ω 20%	½	4514	BTS-680	Video Output Cathode
R46	5100Ω 5%	1	24561		Video Output Plate
R47	10KΩ	½	4597	BTS-10K	Isolation
R48	47KΩ 20%	½	4504	BTS-47K	Isolation
R49	330KΩ 20%	½	4677	BTS-330K	Video Peaking
R50	47KΩ 20%	½	4504	BTS-47K	Voltage Divider See note 3.
R51	330KΩ 20%	½	4677	BTS-330K	Picture Tube Anode
R52	100Ω	½	4566	BTS-100	1st Sound IF Cathode
R53	1000Ω 20%	½	4542	BTS-1000	1st Sound IF Decoupling
R54	47KΩ 20%	½	4504	BTS-47K	2nd Sound IF Grid
R55	100Ω	½	4566	BTS-100	2nd Sound IF Cathode
R56	1000Ω 20%	½	4542	BTS-1000	2nd Sound IF Decoupling
R57	270Ω	½	4663	BTS-270	Balancing
R58	10KΩ	½	4597	BTS-10K	Ratio Detector Diode Load
R59	10KΩ	½	4597	BTS-10K	Ratio Detector Diode Load
R60	15KΩ 20%	½	4521	BTS-15K	De-emphasis
R61	220KΩ	½	4618	BTS-220K	RF Filter See note 4.
R62	1Meg 20%	½	4513	BTS-1Meg	Series Phono
R63	10Meg 20%	½	4505	BTS-10Meg	AF Amplifier Grid
R64	220KΩ	½	4618	BTS-220 K	AF Amplifier Plate
R65	470KΩ 20%	½	4506	BTS-470K	Output Grid
R66	470Ω	1	4531	BTA-470	Output Cathode
R67	470Ω	1	4531	BTA-470	Decoupling
R68	330KΩ	½	34531	BTS-330K	AGC Network See note 1.
R69	10Meg 20%	½	4505	BTS-10Meg	1st Sync. Seperator Grid
R70	22KΩ	½	4628	BTS-22K	1st Sync. Seperator Screen
R71	100KΩ 20%	½	4511	BTS-100K	1st Sync. Seperator Plate
R72	22KΩ	½	4628	BTS-22K	1st Sync. Seperator Plate
R73	18K 20%	½	4662	BTS-18K	Bleeder
R74	220KΩ	½	4618	BTS-220K	2nd Sync. Seperator Grid
R75	3900Ω 5%	½	4654	BTS-3900-5%	2nd Sync. Seperator Cathode
R76	5600 5%	½	4603	BTS-5600-5%	2nd Sync. Seperator Plate
R77A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	5695 ♦	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network
R78	1Meg	½	4614	BTS-1Meg	Vertical Oscillator Grid
R79	1.2Meg	1	34595	BTA-1.2Meg	Vertical Oscillator Plate
R80	100KΩ 20%	½	4511	BTS-100K	Vertical Oscillator Plate Decoupling
R81	10KΩ	½	4597	BTS-10K	Vertical Peaking
R82	1Meg 20%	½	4513	BTS-1Meg	Vertical Output Grid
R83	1500Ω	½	4630	BTS-1500	Vertical Output Cathode
R84	1500Ω	1	4581	BTA-1500	Vertical Output Decoupling
R85	100KΩ	½	4511	BTS-100K	Phase Detector Diode Load
R86	100KΩ	½	4511	BTS-100K	Phase Detector Diode Load
R87	470KΩ	½	4622		AFC Filter
R88	1.5Meg 20%	½	4674		Horizontal MV Grid
R89	1500Ω 5%	½	4610		Horizontal MV Cathode
R90	1000Ω 20%	½	4542		Horizontal MV Cathode
R91	8200Ω	½	4651		Horizontal MV Plate
R92	100KΩ	½	4571		Horizontal MV Grid
R93	180KΩ	½	4634		Horizontal MV Plate
R94	22KΩ	½	4628		Horizontal MV Decoupling
R95	12KΩ	½	4646		Horizontal Peaking
R96	100Ω	½	4566		Parasitic Suppressor
R97	470KΩ	½	4622		Horizontal Output Grid
R98	120Ω	2	4657		Horizontal Output Cathode
R99	8200Ω	2	24580	BTB-8200	Horizontal Output Screen
R100	3.9Ω	½	4751		HV Rectifier Filament - Wire Wound
R101	12Ω	2	4698		Horizontal AFC Feedback
R102	150Ω	10	4730	3 3/4A-150	Filter - Wire Wound
R103	1500Ω	7	4725	3 3/4A-1500	Focus Coil Shunt - Wire Wound See Note 5 & 6
R104	2500Ω	5	4749	3 3/4A-2500	Voltage Dropping - Wire Wound See Note 5 & 6
R105	300Ω	20	4755	DG-300	Voltage Dropping - Wire Wound See Note 7 & 8
R106	180Ω	2	14622		Voltage Dropping See Note 1
R107A	1100Ω	10	4731	3 3/4A-1100	Voltage Dropping } Wire Wound
B	800Ω			3 3/4A-800	Voltage Dropping }

♦ Items R77A, R77B, R77C, C73A, C73B, C73C are combined into one unit.
Note 1. Not used in Chassis 187B
Note 2. Chassis 187B uses a 100KΩ Resistor in this application.
Note 3. Some Models may use a 68KΩ Resistor in this application.
Note 4. Not used in all Models.
Note 5. Not used in Chassis 187C
Note 6. Not connected in Chassis 187B
Note 7. Chassis 187 uses a 750Ω - 20W Resistor in this application
Note 8. Chassis 187B uses a 400Ω - 20W Resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 2A	750VCT .225ADC	5VAC @ 3A Sec. 4 6.3VAC @ 1.2A	6.3VAC @ 9A Sec. 5 6.3VAC @ .9A	5027		P-3059 P-2944	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	180Ω	980Ω	5127	A-8122	A-4003	TB0-2	Vert. Oscillator Trans.
T3	430Ω Tapped @ 225Ω	37.5Ω Tapped @ 3.7Ω 12.1Ω & 33.6Ω Sec. 2 0Ω	5156				Horiz. Output Trans.
T4	1740Ω Tapped @ 120Ω & 128Ω		5154				Vert. Output Trans.
T5	1500Ω		5341 ①				Focus Coil
T6A	24Ω		9714				Horiz. Deflection Coils
B	46Ω						Vert. Deflection Coils

① Used only in chassis 187

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	6.5KΩ	3.7Ω	370Ω	.3Ω	5147	A-3823	A-3020	RO-13	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA HOFFMAN PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	P.M.	3.7Ω	9070	12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP2	11¼in.	1 in.				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA HOFFMAN PART No.	MERIT PART No.	NOTES
L1	Ant. Coils	0Ω	0Ω	5360		Channel #2 (other channel strips in Misc.)
L2	Fil. Choke	0Ω				
L3	RF Choke	0Ω				
L4	RF, Mixer Grid & Osc. coils	0Ω		5348		Channel 2 (other channel strips in Misc.)
L5	Fil. Choke	0Ω				
L6	RF Choke	0Ω				
L7	1st.Video IF	.6Ω				
L8	Video IF coupling	.2Ω		5298		
L9	2nd.Video IF	.2Ω		5298		
L10	Adj.Sound trap	.2Ω		5396		
L11	Sound Take Off	0Ω		5394		
L12	3rd. Video IF	.2Ω		5298		
L13	4th.Video IF	.2Ω		5298		
L14	Sound Trap	0Ω	.1Ω	5299		
L15	5th.Video IF	.2Ω		5298		
L16	Adj.Sound trap	.2Ω		5395		
L17	Peaking Coil	1Ω		5424		180 Microhenries, Wound on 18KΩ Resistor
L18	78.3MC Trap	.1Ω		5410		
L19	4.5MC trap	2.8Ω		5402		
L20	Peaking Coil	12Ω		5417		215 Microhenries, Wound on 18KΩ Resistor
L21	Peaking Coil	12.4Ω		5418		260 Microhenries
L22	Fil. Choke	0Ω				
L23	Sound IF	.1Ω	.1Ω	5304		
L24	Ratio Det. Trans.	.1Ω	.1Ω	5305		
L25	Horiz. Osc.	68Ω		5300		
L26	Width Coil	8Ω		5423	MWC-1	
L27	Horiz. Lin.	6.5Ω		5422		Tap at 1.7Ω
L28	Anti Ringing coil	0Ω		5286		
L29	Anti Ringing coil.	0Ω		5286		

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

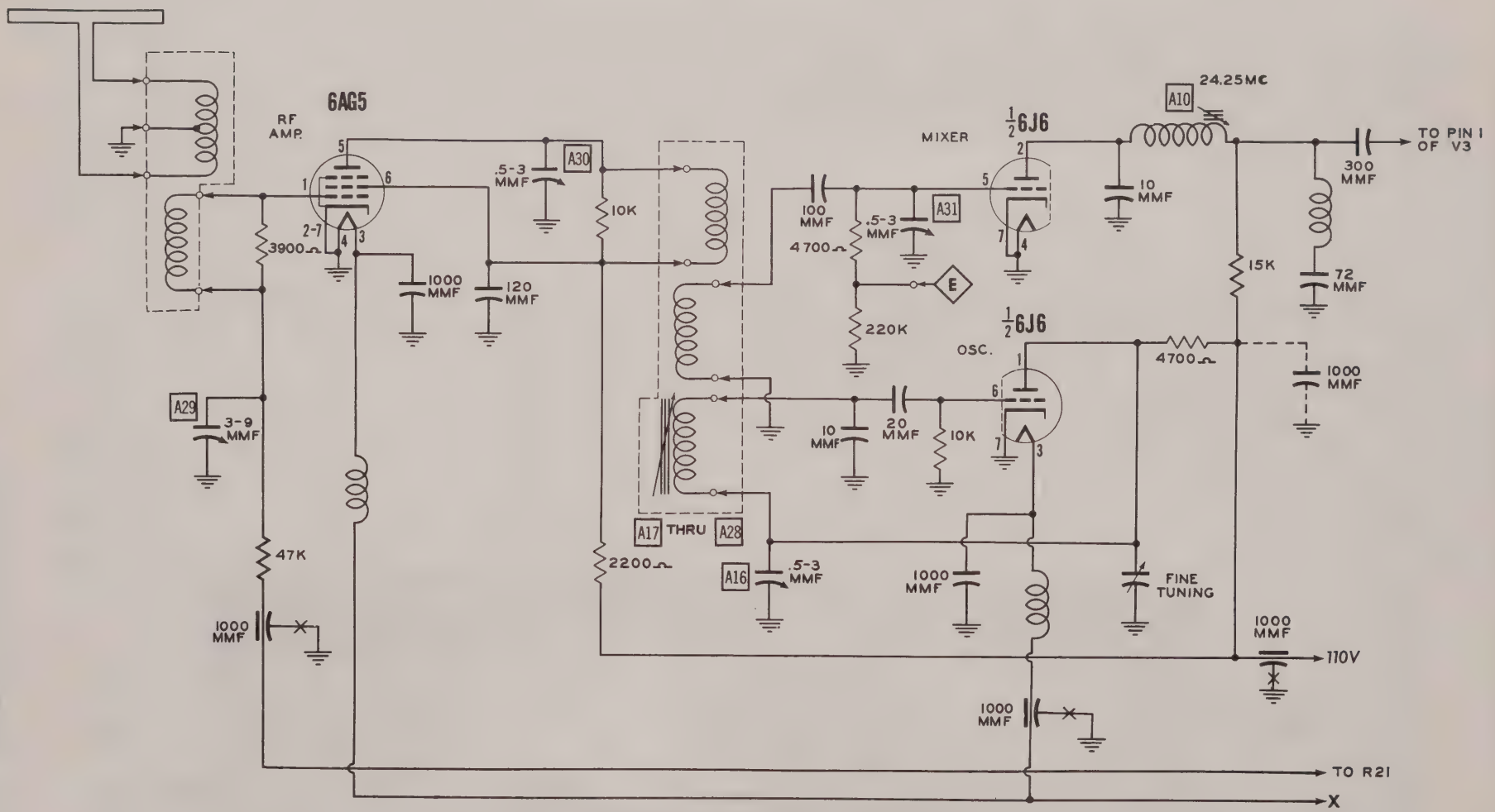
ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			HOFFMAN PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Slo-Blo	3.2A	9648		31303.2	342001	
M2	3AG Slo-Blo	150MA	9717		313.250	357001	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					HOFFMAN PART No.		
M3	Bayonet	7.5	.2	White	9676	9676	Type No. 51

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M4A	RF Tuner	9717	(RF-8)
B	RF Tuner	9716	Alternate (RF-7)
C	RF Tuner	9684	Alternate (RF-6)
M5	Switch	6007	Focus Range (Not used in all models)
M6	Switch	6028	TV -Phono
M7	Centering Magnet	9722	
M8	Ion Trap	9713	
	Ant. Coils	5361	Channel #3
	Ant Coils	5362	Channel #4
	Ant. Coils	5363	Channel #5
	Ant. Coils	5364	Channel #6
	Ant. Coils	5365	Channel #7
	Ant. Coils	5366	Channel #8
	Ant. Coils	5367	Channel #9
	Ant. Coils	5368	Channel #10
	Ant. Coils	5369	Channel #11
	Ant. Coils	5370	Channel #12
	Ant. Coils	5371	Channel #13
	RF, Mixer Grid and Osc Coil	5348	Channel #2
	RF, Mixer Grid and Osc. Coil	5349	Channel #3
	RF, Mixer Grid and Osc. Coil	5350	Channel #4
	RF, Mixer Grid and Osc. Coil	5351	Channel #5
	RF, Mixer, Grid and Osc. Coil	5352	Channel #6
	RF, Mixer, Grid and Osc. Coil	5353	Channel #7
	RF, Mixer, Grid and Osc. Coil	5354	Channel #8
	RF, Mixer, Grid and Osc. Coil	5355	Channel #9
	RF, Mixer, Grid and Osc. Coil	5356	Channel #10
	RF, Mixer, Grid and Osc. Coil	5357	Channel #11
	RF, Mixer, Grid and Osc. Coil	5358	Channel #12
	RF, Mixer, Grid and Osc. Coil	5359	Channel #13



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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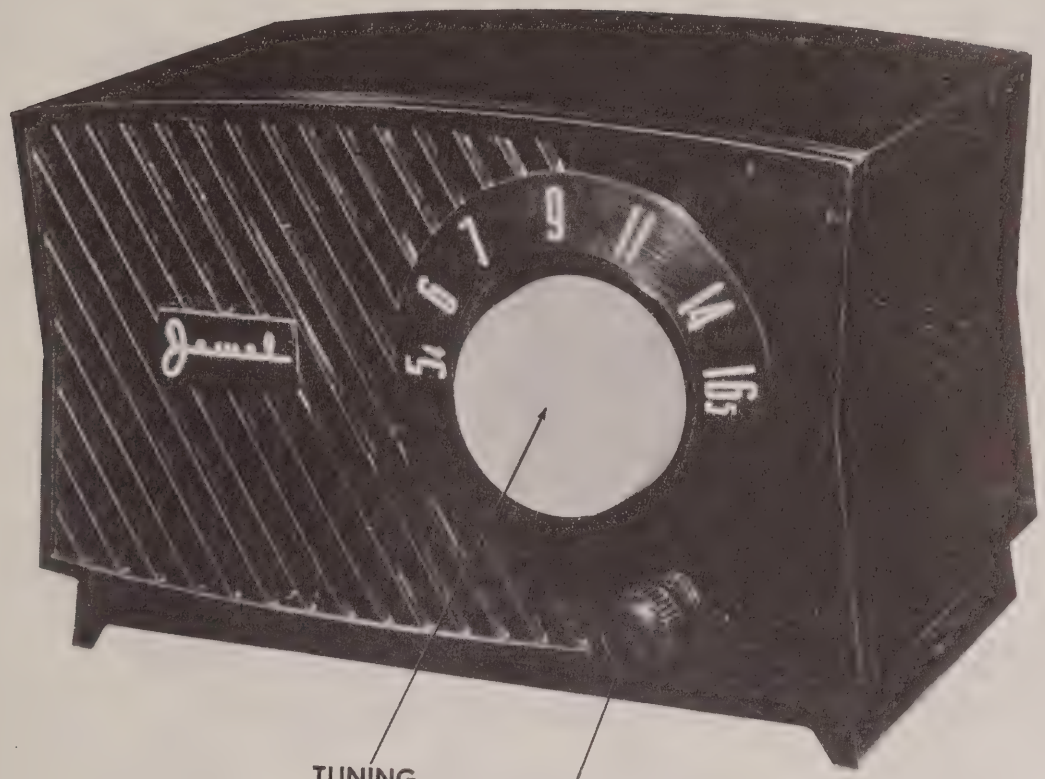
ALTERNATE TUNER SCHEMATIC



JEWEL
MODELS 5100E, U

JEWEL
MODELS 5100E, U

TRADE NAME	Jewel Models 5100E, U
MANUFACTURER	Jewel Radio Co., 10-40 45th Ave., Long Island City 1, N.Y.
TYPE SET	AC-DC Operated Superheterodyne Receiver
TUBES (FOUR)	Types 12BE6 Conv., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier.
POWER SUPPLY	110-120 Volts AC/DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	45MMF	High side to ant. terminal on ant. coil, (remove hank) Low side to chassis.	1650KC	"	"	A3	Adjust for maximum output.
3.	"	"	1400KC	Tune for max. signal.	"	A4	"

PROPERTY OF
E. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		JEWEL PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V3	Audio Output	50C5	50C5	7CV	
V4	Rect.	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES * AND INSTALLATION NOTES
	CAP.	VOLT	JEWEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	31-18	PRS150/40-		BRD4415A		TVA-2445	Filter
B	40	150		40					Filter
C2	.002	600	32-17	P688-002	D6-202	PTE6D2	GP-333-202	6TM-D2	Ant. Isolation
C3	.05	400	32-4	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C4	100		35-4	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Osc. Grid Cap. *
C5	100		35-4	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Diode RF Filter
C6	.002	600	32-17	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Coupling
C7	.01	400	32-39	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C8	.01	400	32-39	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Output Plate
C9	.05	400	32-4	P488-05	DF-503	PTE4S5		4TM-S5	Rectifier Plate
C10	.2	200	32-13	P488-22		GT4P2		2TM-P22	Line Isolation *

* Not used in all Models

CONTROLS

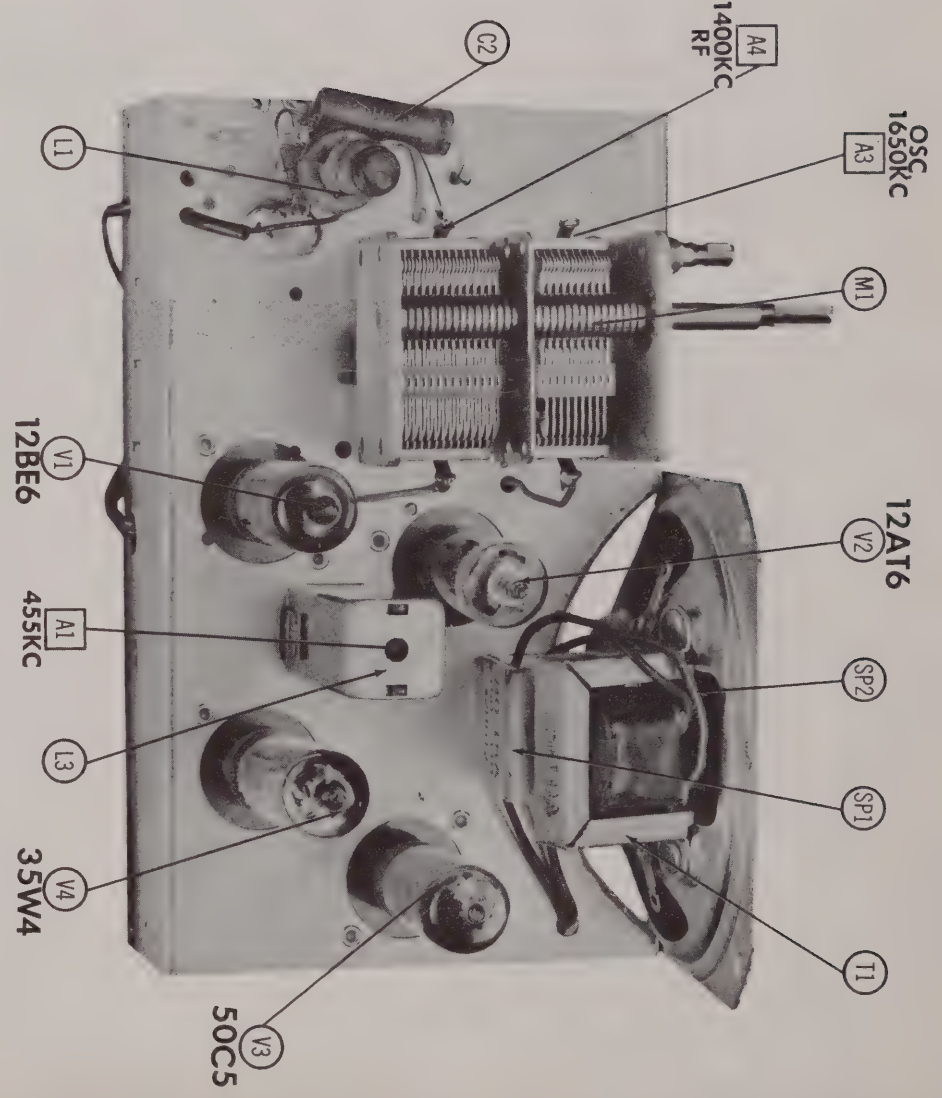
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESIST-ANCE	WATTS	JEWEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	50-11B	Q13-139	AG66-Z	AN-76	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K155	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	JEWEL PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	Osc. Grid
R3	4.7Meg	½		BTS-4.7Meg	AVC Network
R4	10Meg	½		BTS-10Meg	AF Amp. Grid
R5	470KΩ	½		BTS-470K	AF Amp. Plate
R6	330KΩ	½		BTS-330K	Output Grid - See Note 1
R7	150Ω	1		BTS-150	Output Cathode - See Note 2
R8	1.5KΩ	1		BW-1-1500	Filter
R9	22Ω	½			Filament Dropping
R10	22Ω	½			Line Dropping

Note 1 - Some Models use 470KΩ Resistor in this application
Note 2 - Not used in all Models

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		JEWEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	1.8KΩ	3.3Ω	130Ω	.5Ω		A-3332	A-3025	RO-2 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	JEWEL PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.2Ω		ST-113 Mod. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

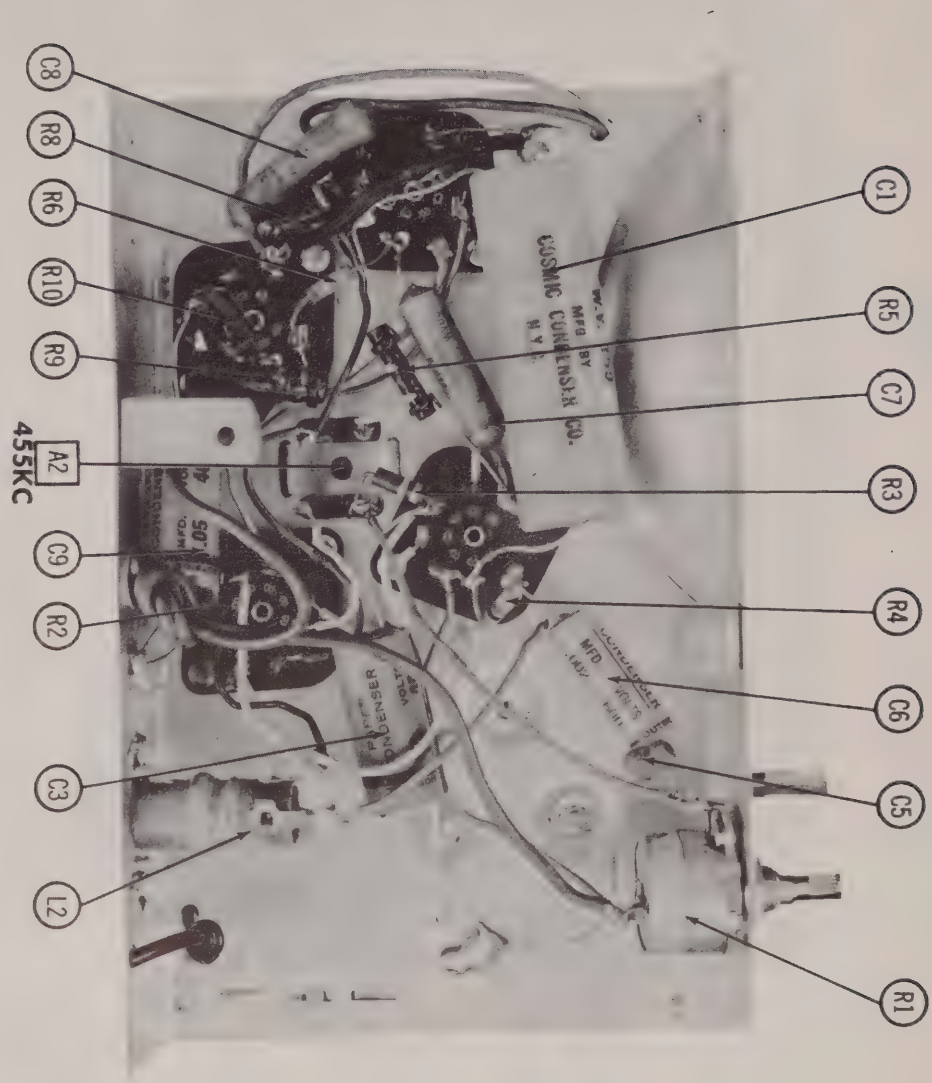
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	JEWEL PART No.	MERIT PART No.	
L1	Ant. Coil	65Ω	2.7Ω			
L2	Osc. Coil	.4Ω	5.8Ω	60-14		
L3	IF Trans.	20Ω	19.5Ω	61-14		

MISCELLANEOUS

ITEM No.	PART NAME	JEWEL PART No.	NOTES
M1	2 Gang Var. Cap.	30-18	(29-452MMF, 29-197MMF)

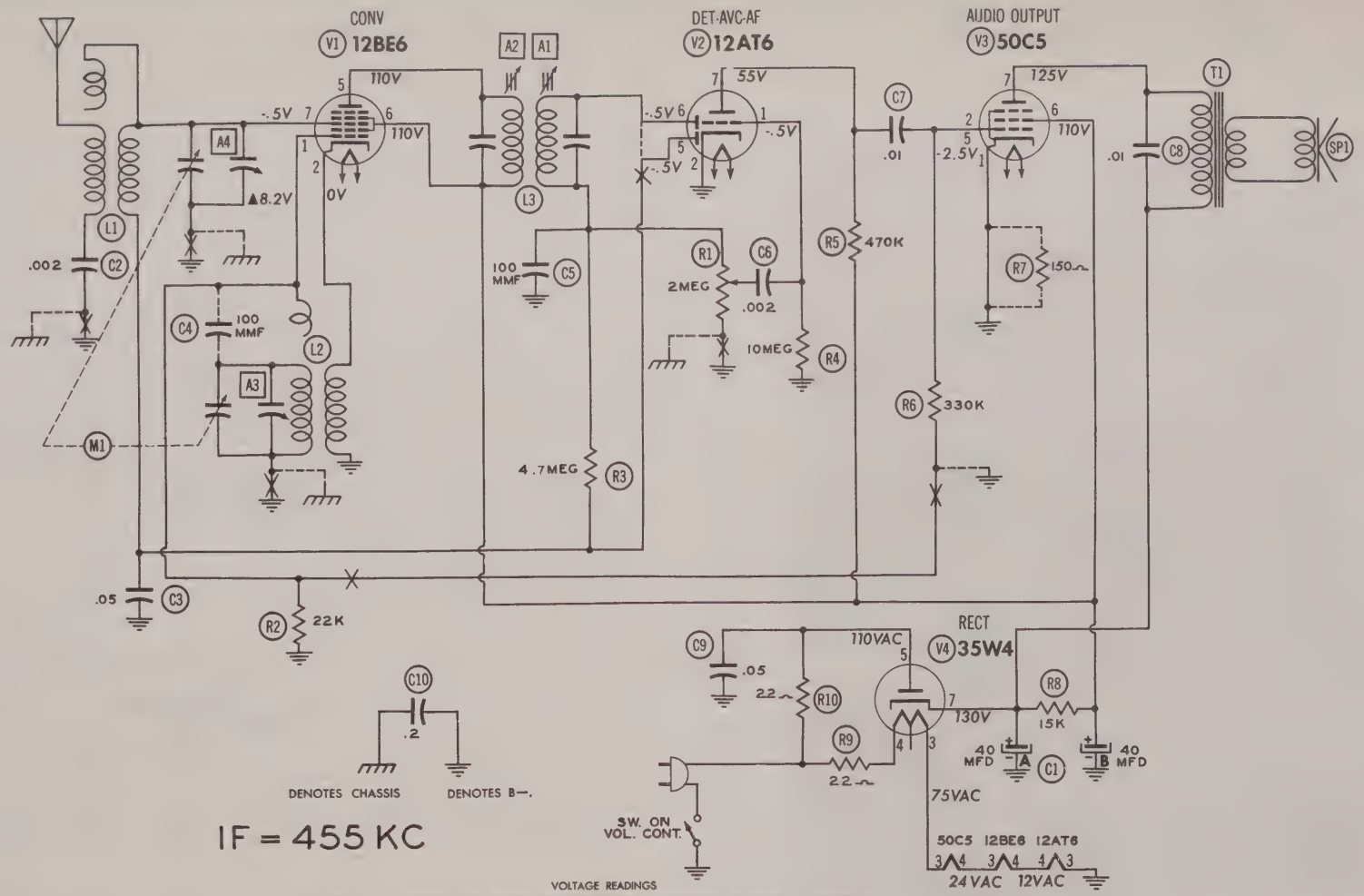
CHASSIS—BOTTOM VIEW



SET 159 FOLDER 7

JEWEL MODEL 5100E

JEWEL MODEL 5100E



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.4Ω	24Ω	12Ω	†1.5KΩ	†1.5KΩ	6.7Meg
V 2	12AT6	10Meg	0Ω	0Ω	12Ω	6.7Meg	2Meg	†470KΩ
V 3	50C5	0Ω	350KΩ	74Ω	24Ω	350KΩ	†1.5KΩ	†130Ω
V 4	35W4	22KΩ	1Ω	74Ω	110Ω	153Ω	90Ω	40KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V4

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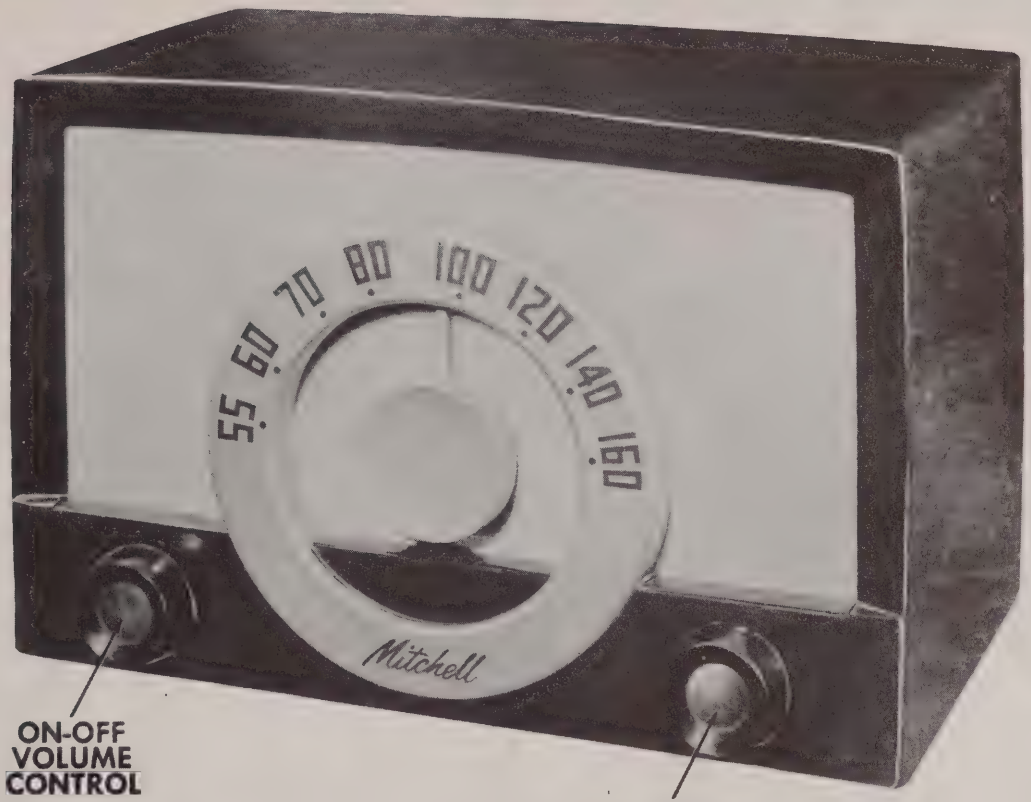
159-7

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MITCHELL
MODELS 1254, 1255



MITCHELL
MODELS 1254, 1255

MITCHELL MODEL 1254

TRADE NAME	Mitchell Models 1254, 1255
MANUFACTURER	Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago, 14, Ill.
TYPE SET	AC-DC Operated Superheterodyne Receiver With Loop Antenna
TUBES (SIX)	Types 12AW6 or 12AU6 Mixer, 6C4 Osc., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Power Output, 35Z5 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available, If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 1, (grid) of 12AW6, (V1). Low side to B-.	455KC (400~ mod)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loops of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	"	A6	"

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PARTS LIST AND DESCRIPTIONS

MITCHELL MODEL 1254

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MITCHELL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1A	Mixer	12AW6	12AW6	7CM	
B	Mixer	12AU6	12AU6	7BK	
V2	Oscillator	6C4	6C4	6BG	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det-AVC-AF-Amp.	12AV6	12AV6	7BT	
V5	Power Output	50C5	50C5	7CV	
V6	Rectifier	35Z5	35Z5	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MITCHELL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	N-5051	PRS150/40-40		BRD4415A		TVA-2445	Filter (Yellow)
B	40	150							Filter (Red)
C2	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Tuning Cap. Isolation
C3	.01	400	N-1344	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	RF Coupling
C4	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C5	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	RF Amp. Dec.
C6	100		N-6015	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Diode RF Filter
C7	.005	600	N-4894	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C8	250		N-6488	SI250	D6-251	5W5T25	GP2K-251		AF Amp. Plate
C9	.01	400	N-1344	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C10	.02	400	N-1376	P488-02	DF-203	PTE4S2		4TM-S2	Power Output Plate
C11	.05	400	N-1346	P488-05	DF-503	PTE4S5		4TM-S5	Rectifier Plate
C12	.08	200	N-8092						Line Isolation

CONTROLS

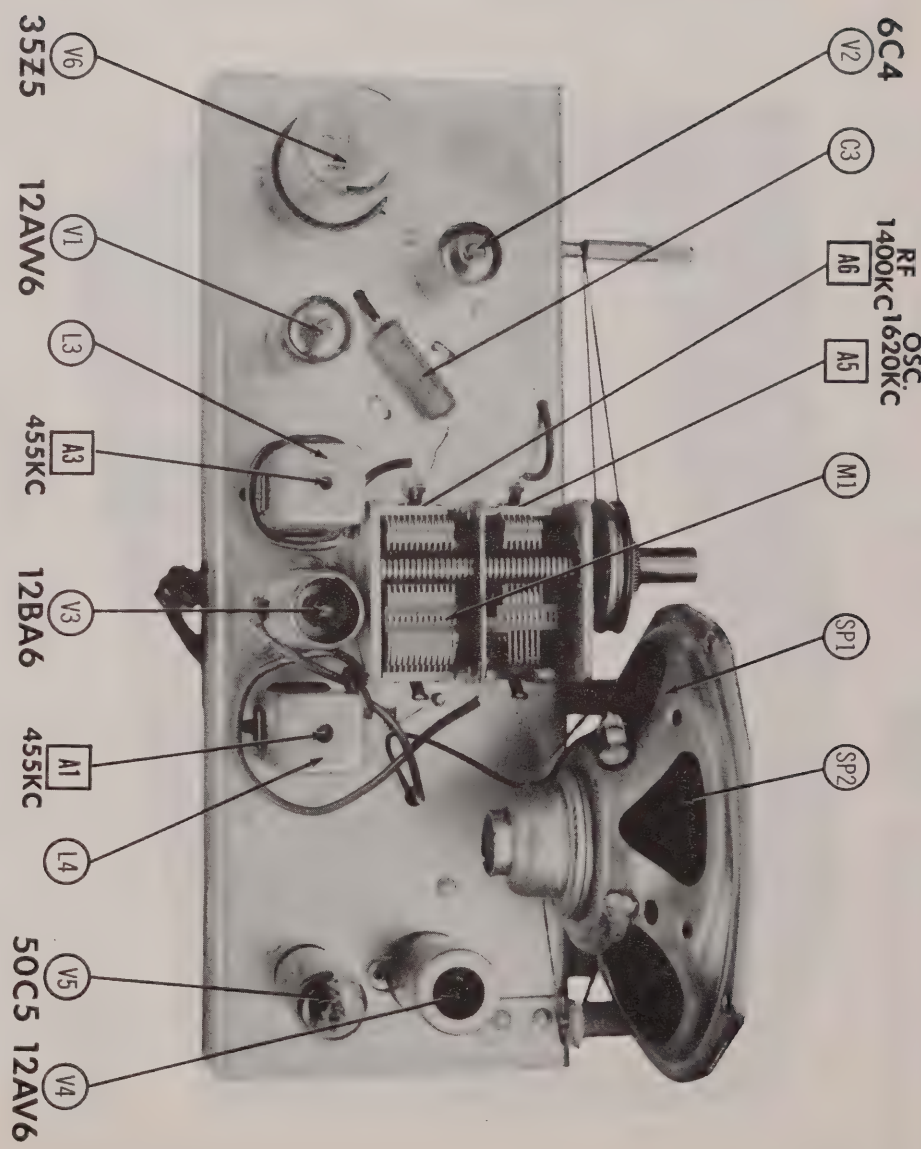
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MITCHELL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	N-7984	Q-13-133	AG-60-Z	BKS-60-S	Volume Control and Switch-See Note
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

NOTE: Connect a 47KΩ resistor between the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MITCHELL PART No.	IRC PART No.	IDENTIFICATION CODES
R2	3.3Meg	½	N-4062	BTS- 3.3Meg	RF Amplifier Grid
R3	47KΩ	½	N-4063	BTS-47K	Mixer Decoupling
R4	47KΩ	½	N-4063	BTS-47K	Oscillator Grid
R5	1.2Meg	½	N-1262	BTS-1.2Meg	AVC Network
R6	68Ω	½	N-6485	BTS-68	IF Amplifier Cathode
R7	6.2Meg	½	N-4068	BTS-6.2Meg	AF Amplifier Grid
R8	240KΩ	½	N-4026	BTS- 270K	AF Amplifier Plate Load
R9	500KΩ	½	N-7984	BTS-470K	Output Grid
R10	180Ω	½	N-4067	BTS-180	Output Cathode
R11	910Ω	½	N-3341		Filter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MITCHELL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.2KΩ Tapped @ 50Ω	3.4Ω	156Ω Tapped @ 6Ω	.5Ω	N-8001	A-3330 ①	A-3031 ①	RO-2 ① ②	① Drill one new mounting hole. ② Add extra Filter To Reduce Hum Level.

SPEAKER

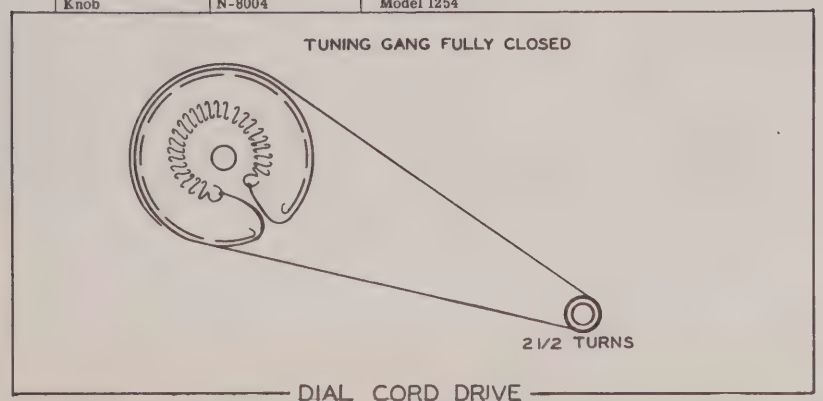
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	MITCHELL PART No.	VIKING PART No.	QUAM PART No.	
SP1	P.M.	3.4Ω	N-7980	5J4	5A1	
	CONE DIA.	V. C. DIA.				
SP2	4 1/2 in.	9/16 in.				

COILS (RF-IF)

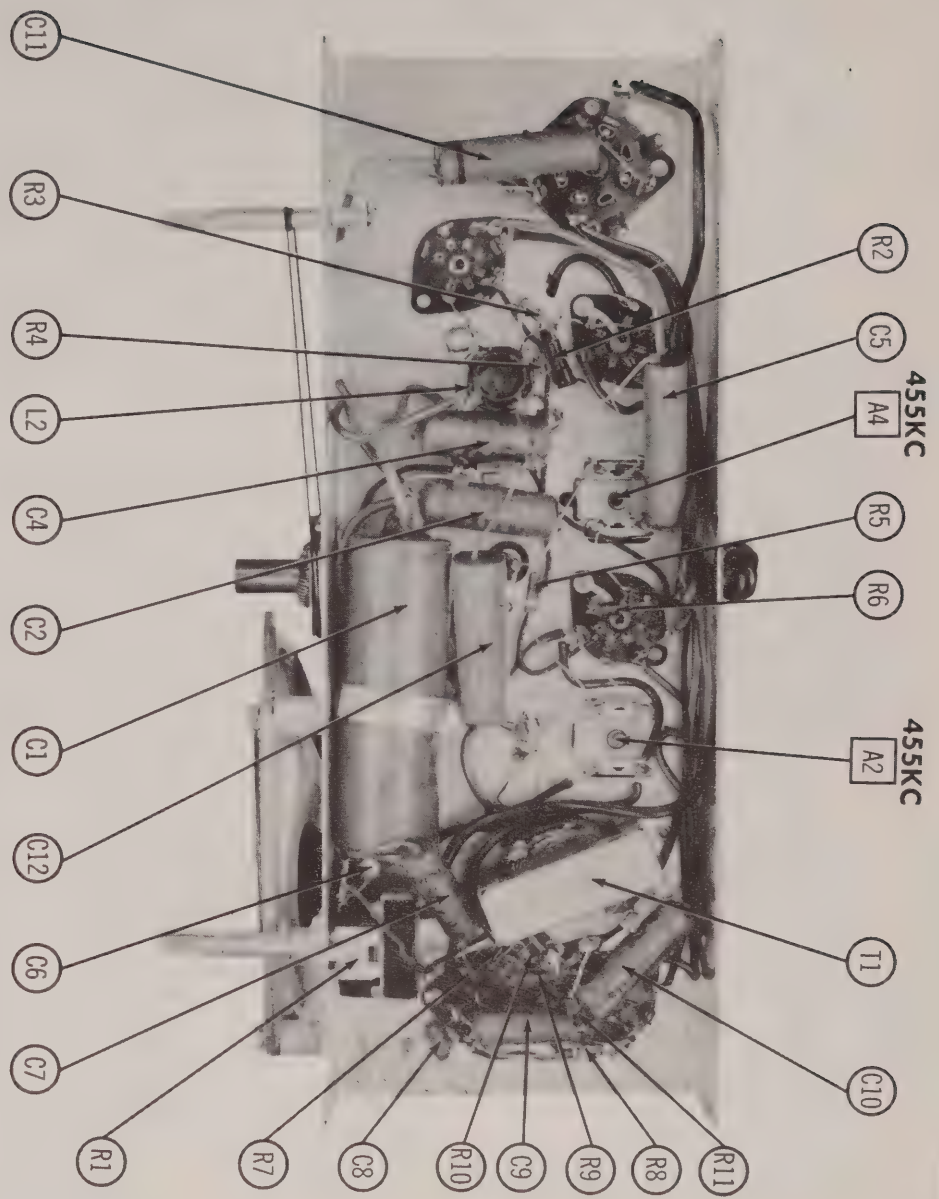
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MITCHELL PART No.	MERIT PART No.	
L1	Loop Ant.	2.2Ω	.2Ω	N-8002		
L2	Osc. Coil	4.8Ω	7.5Ω	N-7982		Tap at 4Ω
L3	Input IF	15Ω	15Ω	N-7981	BC-352	
L4	Output IF	15Ω	15Ω	N-7981	BC-352	

MISCELLANEOUS

ITEM No.	PART NAME	Mitchell PART No.	NOTES
M1	2 Gang Var. Cap.	N-8045	(23-397MMF, 20-153MMF)
	Cabinet	314	Model 1255 (Ivory)
	Cabinet	315	Model 1254 (Walnut)
	Pointer	N-8392	
	Knob	N-8003	Model 1255
	Knob	N-8004	Model 1254



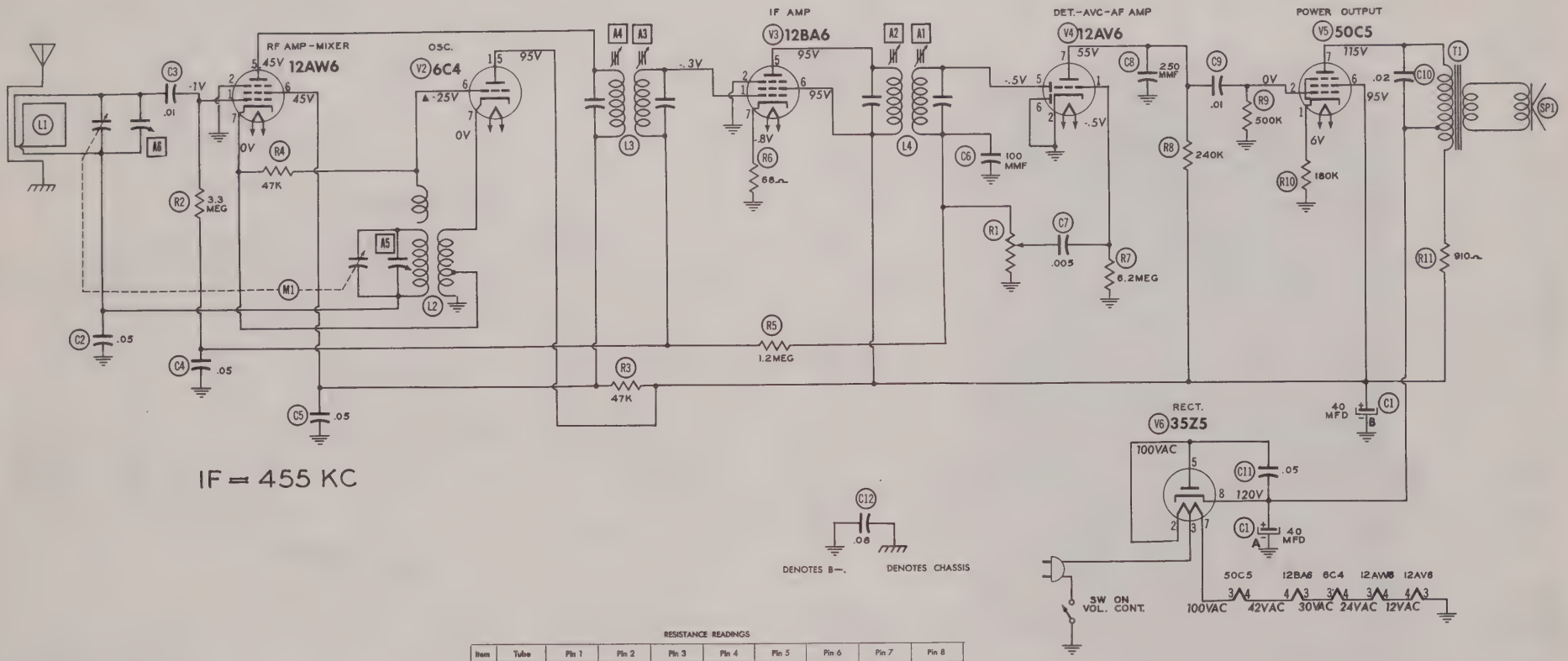
CHASSIS—BOTTOM VIEW



SET 159 FOLDER 8

MITCHELL MODEL 1254

MITCHELL MODEL 1254



IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12AW6	5Meg	.3Ω	24Ω	12Ω	†48KΩ	†48KΩ	.3Ω	
V 2	6C4	†1KΩ	INF	30Ω	24Ω	†1KΩ	47KΩ	4.7Ω	
V 3	12BA6	1.7Meg	0Ω	30Ω	42Ω	†1KΩ	†1KΩ	68Ω	
V 4	12AV6	6.2Meg	0Ω	0Ω	12Ω	500KΩ	0Ω	†220KΩ	
V 5	50C5	180Ω	470KΩ	92	42Ω	470KΩ	†1KΩ	†156Ω	
V 6	35Z5GT	INF	127Ω	120Ω	INF	127Ω	INF	92Ω	70KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V6

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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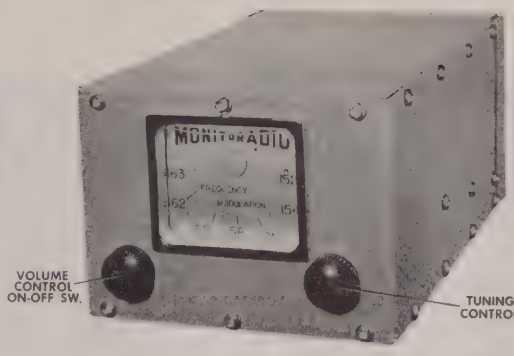

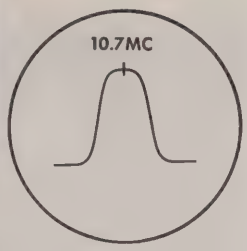

FIG. 1

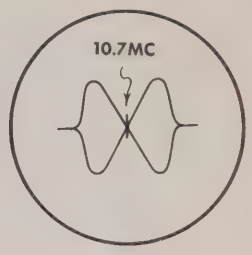

FIG. 2

TRADE NAME	Monitoradio Model M-101
MANUFACTURER	Radio Apparatus Corp., 55N. New Jersey, Indianapolis, Ind.
TYPE SET	Battery Operated Mobile High Freq. FM Receiver
TUBES (Seven)	Types 12AT7 Conv., (2) 6BJ6 IF Amp.,6T8 Ratio Det.-AF Amp., 6AQ5 Audio Output, OB2 Voltage Regulator, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 6 Amp. @ 6.3VDC
TUNING RANGE—	Freq. Mod. 152-163MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to pin 1, (grid) of 6BJ6, (V2). Low side to chassis.	10.7MC (unmod)	Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	High side to pin 7, (grid)of 12AT7, (V1). Low side to chassis.	"	"	"	A4, A5	"
3.	"	"	"	"	DC probe to point Ⓑ. Common to point C.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to Pin 1, (Grid), of 6BJ6, (V2) Low side to chassis.	10.7MC (450KC swp)	Point of non-interference.	Vert. amp. to Point Ⓐ. Low side to chassis.	A1, A2, A3	Disconnect stabilizor capacitor C2. Adjust for maximum amplitude and symmetry as per Fig. 1.
2.	"	High side to Pin 7, (grid) of 12AT7, (V1). Low side to chassis.	"	"	"	A4, A5	"
3.	"	"	"	"	Vert. amp. to Point Ⓑ. Low side to chassis.	A6	Reconnect capacitor C2. Adjust A6 so 10.7MC occurs at center of cross-over lines as per Fig. 2. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	Direct	High side to ant. receptacle. Low side to chassis.	162MC (unmod.)	162MC	DC probe to point Ⓐ. Common to chassis.	A7, A8	Adjust for maximum deflection.
5.	"	"	152MC	152MC	"	L1, L4	Expand or compress coil turn for max. deflection. Repeat steps 4 and 5 until no further improvement can be made.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		MONITORADIO PART No.	STANDARD REPLACEMENT		
V1	Converter	12AT7	12AT7	9A	
V2	1st IF Amp.	6BJ6	6BJ6	7CM	
V3	2nd IF Amp.	6BJ6	6BJ6	7CM	
V4	Ratio Det. -AF Amp.	6T8	6T8	9E	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Volt. Reg.	0B2	0B2	5BD	
V7	Rect.	6X4	6X4	5BS	

CAPACITORS

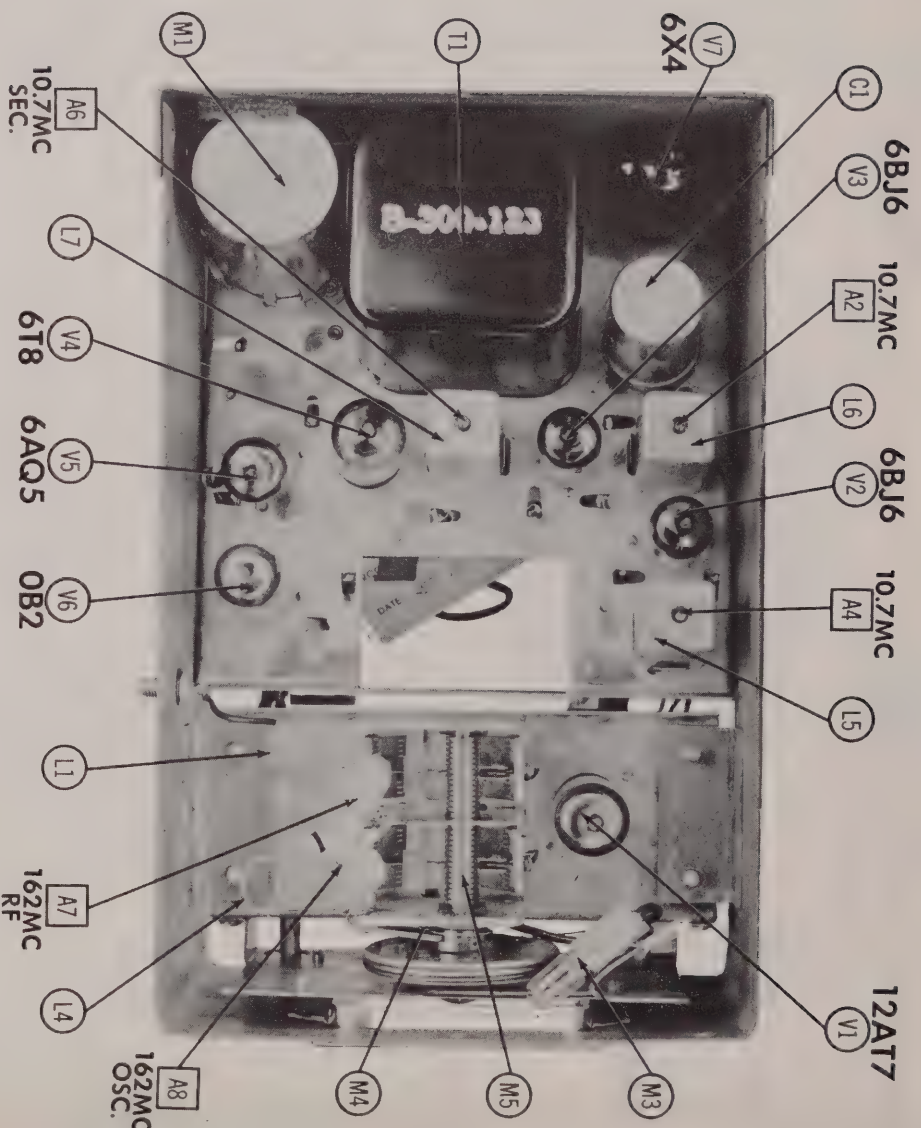
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Monitoradio PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	250	B-300-082-5	AFH3-97		UP2230C		TVL-3565	▲ Filter
B	20	250							■ Filter
C	20	25							Audio Output Cathode
C2	2	50	B-300-109-1	PRS150/4		BBR2-50		TVA-1301	Stabilizing Cap.
C3	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Mixer Cathode
C4	270		JCD-A1	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	Osc. Plate
C5	27	500	PQ			5R5Q5		MS-43	Osc. Grid Cap.
C6	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Conv. Dec.
C7	270		JCD-A1	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	Conv. Fil.
C8	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	RF Bypass
C9	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	1st IF Amp. Decoupling
C10	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	1st IF Amp. Cathode
C11	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	1st IF Amp. Fil.
C12	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	RF Bypass
C13	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	2nd IF Amp. Decoupling
C14	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	2nd IF Amp. Cathode
C15	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	2nd IF Amp. Fil.
C16	100	500		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Diode Load Cap.
C17	100	500		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Diode Load Cap.
C18	1000		JCD-A2	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	De-emphasis
C19	.01	400	365-35	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C20	270		JCD-A1	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	AF Amp. Grid
C21	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	Audio Coupling
C22	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Audio Output Plate
C23	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	Fil. Bypass
C24	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	RF Bypass
C25	.0075	1600	OW-347	P1688-0075		PTE16D75		MB-D75	Buffer Cap.
C26	.47	100	A-100-276	P188-5		GT2P5		684P20	Buffer Cap.
C27	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	Buffer Cap.
C28	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	Hash Filter
C29	10000		JCD-D7	BPD-01	DF-104	1D3S1	821-01	5HK-S1	Hash Filter
C30	5000		JCD-C4	SI5000	D6-502	1D5D5	GP2-333-502	5HK-D5	Hash Filter
C31	27	500	PQ	SI27	D6-270	5W5Q3	GP1K-270	MS-43	Fil. Bypass
C32	2.7		A-100-203				N750K-2R7		Osc. Feedback

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Monitoradio PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	1Meg	½	A-100-093-5	Q13-137	AG-63-Z	BSK-70-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions.
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MONITORADIO PART No.	IRC PART No.	
R2	1000Ω	1/2		BTS-1000	Mixer Cathode
R3	10KΩ	1/2		BTS-10K	Oscillator Grid
R4	1000Ω	1/2		BTS-1000	Oscillator Plate
R5	82Ω	1/2			1st IF Amplifier Cathode
R6	470Ω	1/2		BTS-470	1st IF Amplifier Decoupling
R7	82Ω	1/2			2nd IF Amplfier Cathode
R8	470Ω	1/2		BTS-470	2nd IF Amplifier Decoupling
R9	2700Ω	2		BTA-2700	Decoupling
R10	40KΩ	1/2		BTS-40K	De-emphasis
R11	10Meg	1/2		BTS-10Meg	AF Amplifier Grid
R12	47KΩ	1/2		BTS-47K	Ratio Detector Diode Load
R13	220KΩ	1/2		BTS-220K	AF Amplifier Plate
R14	470KΩ	1/2		BTS-470K	Output Grid
R15	330Ω	1		BTB-330	Output Cathode
R16	4700Ω	2		BTA-4700	Decoupling
R17	270Ω	2		BW2-270	Filter
R18	15KΩ	1/2		BTS-15K	Hash Suppressor
R19	47Ω	1/2			Voltage Divider
R20	39Ω	2			Series Dial Light

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	Monitoradio PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC ②3.6ADC	460VCT .073ADC			B-300-123	P-6473 ① ②	P-4079 ① ②	VT-5 ①

① Drill new mounting holes.
② Add series Resistor to reduce plate voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Monitoradio PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	3.7KΩ	3.2Ω	180Ω	.6Ω	Part of B-300-108	A-2900 ③	A-3856 ③	RO-301 ③	③ Bend mounting tabs down, file out slots and mount on original bracket.

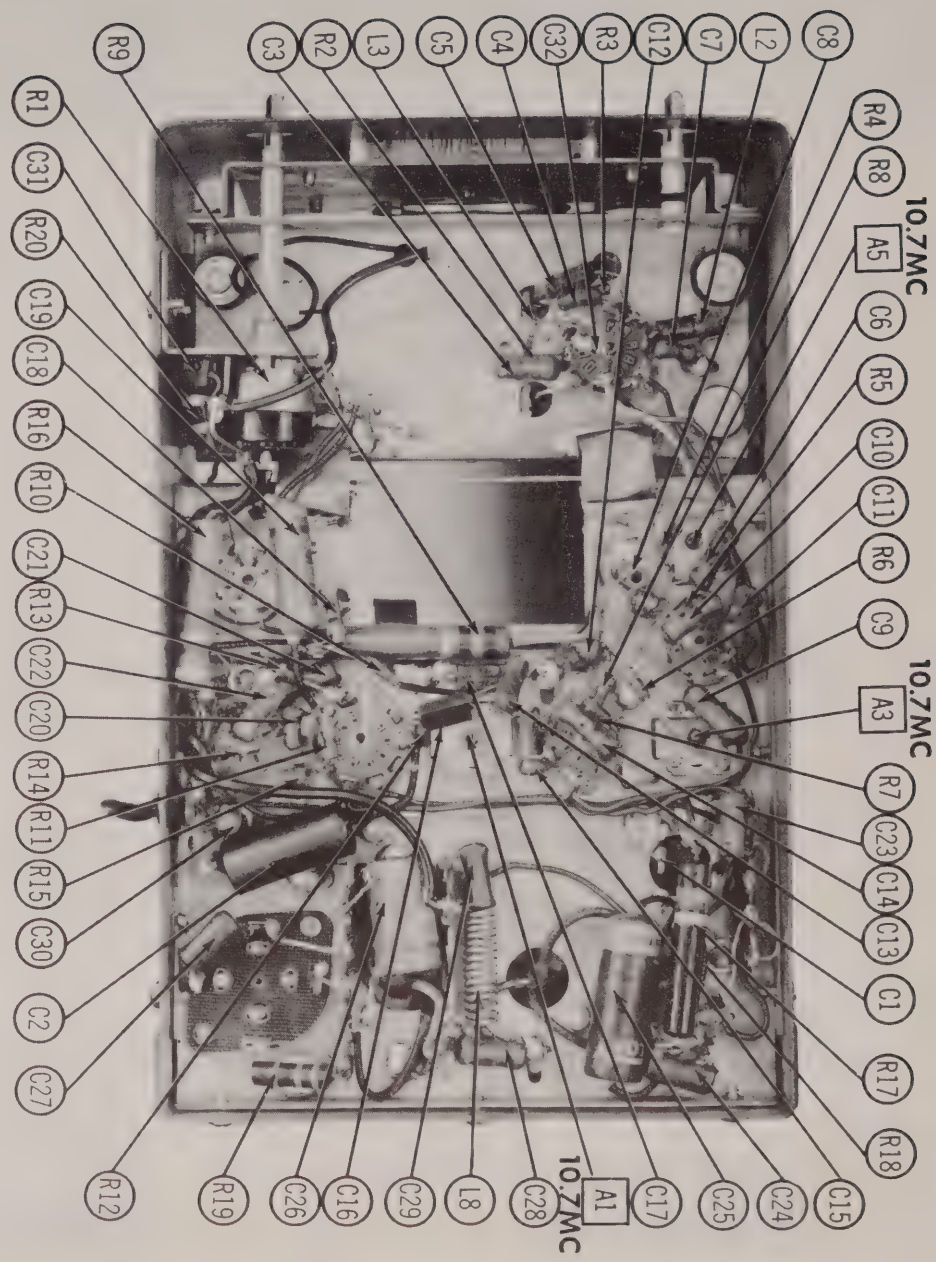
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Monitoradio PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.0Ω	Part of B-300-108	ST-105 ④ Mod. P5-X	5A1 ④	④ Remount Output Transformer
	CONE DIA.	V. C. DIA.				
SP2	4 7/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Monitoradio PART No.	MERIT PART No.	IRC PART No.	
L1	Ant. Coil	0Ω		B-300-121-2			
L2	Cath. Choke	.8Ω				CLA	1 Microhenries
L3	Fil. Choke	0Ω					
L4	Osc. Coil	0Ω		B-300-121-1			
L5	Input IF	.6Ω	.6Ω	B-300-077-2			
L6	Output IF	.6Ω	.6Ω	B-300-077-2			
L7	Ratio Det. Trans.	2.2Ω	.2Ω	106-5			Tap at .4Ω
L8	Hash Choke	0Ω		A-100-192			

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				Monitoradio PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Interrupter	6.3 VDC	115 ∿	673	5306	5306	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			Monitoradio PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	3AG	10A			311010	157020	

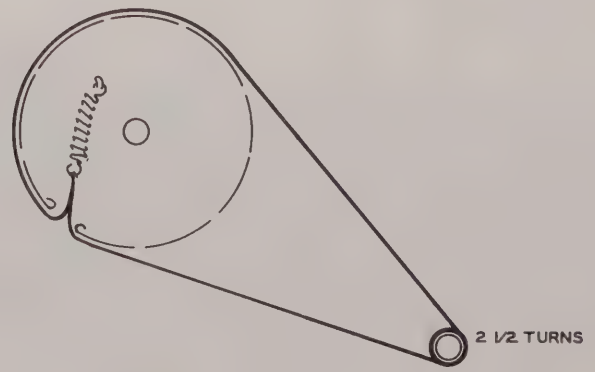
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Monitoradio PART No.		
M3	Bayonet	6-8	.15	Brown			Type No. 47

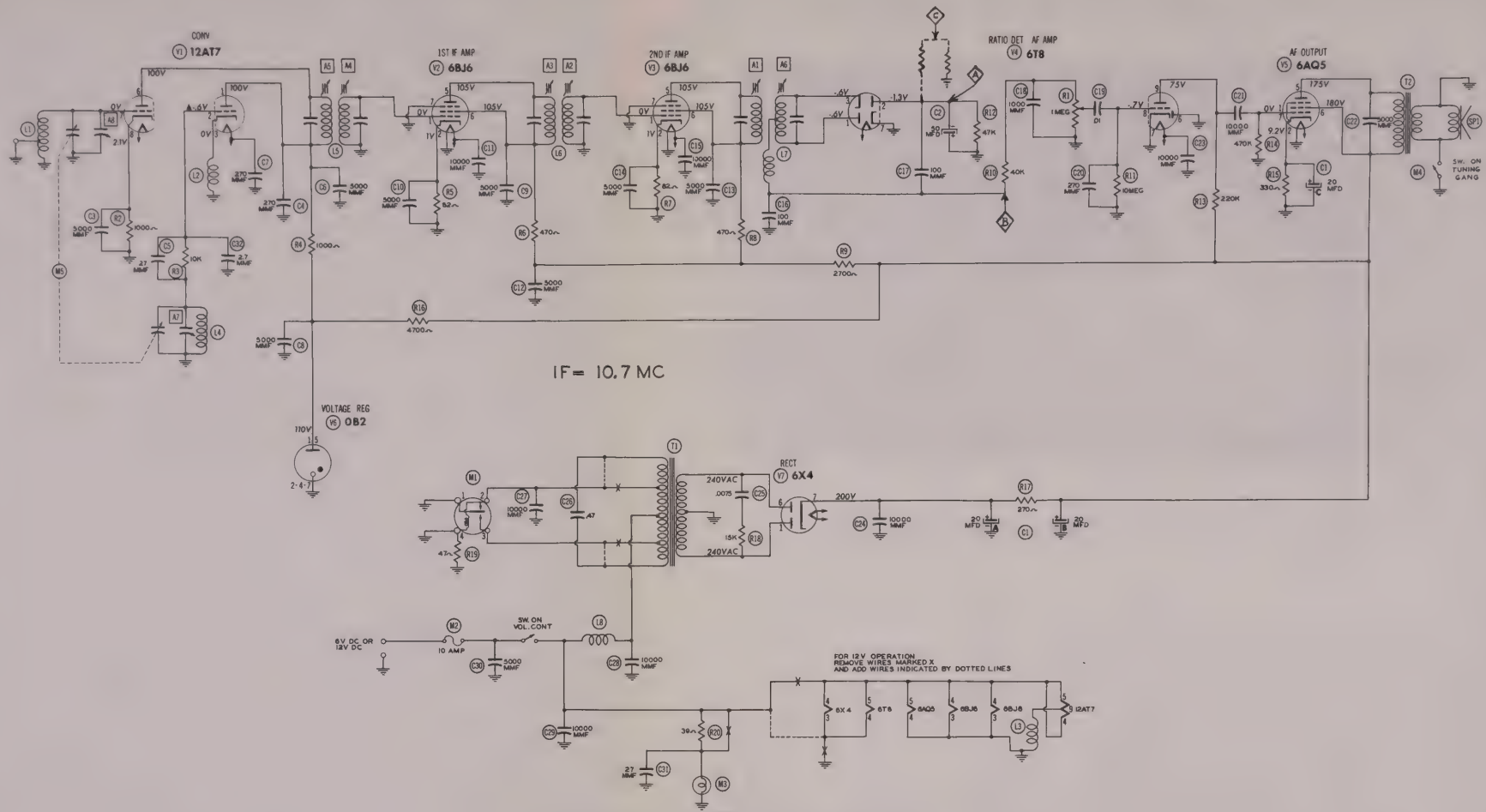
MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M4	Switch		Speaker Shorting
M5	Tuning Gang	B-300-107-1	
A6	Trimmer	TS2A-N300	Osc. Adj. (5-20MMF)
A7	Trimmer	TS2A-N300	Ant. Adj. (5-20MMF)
	Knob	404	
	Dial Pointer	A-100-190	
	Dial Face	B-300-124-1	

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†5.9KΩ	10KΩ	.8Ω	.6Ω	.6Ω	†5.9KΩ	.1Ω	1KΩ	0Ω
V 2	6BJ6	.7Ω	82Ω	0Ω	.6Ω	†3.4KΩ	†3.4KΩ	0Ω		
V 3	6BJ6	.7Ω	82Ω	0Ω	.6Ω	†3.4KΩ	†3.4KΩ	0Ω		
V 4	6T8	1Meg	47KΩ	1Meg	0Ω	.6Ω	0Ω	0Ω	10Meg	†220KΩ
V 5	6AQ5	470KΩ	330Ω	.6Ω	0Ω	†450Ω	†270Ω	470KΩ		
V 6	0B2	†5KΩ	0Ω	Inf.	0Ω	†5KΩ	Inf	0Ω		
V 7	6X4	165Ω	15KΩ	0Ω	.6Ω	0Ω	165Ω	110KΩ		

* TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V7

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

MOTOROLA
MODELS 17K5E, 17K9, B, BC, 17T3G, 17T4E

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MODEL 17K9BC

MOTOROLA
MODELS 17K5E, 17K9, B, BC, 17T3G, 17T4E

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*TRADE MARK

MOTOROLA
MODELS 17K5E, 17K9, B, BC, 17T3G, 17T4E

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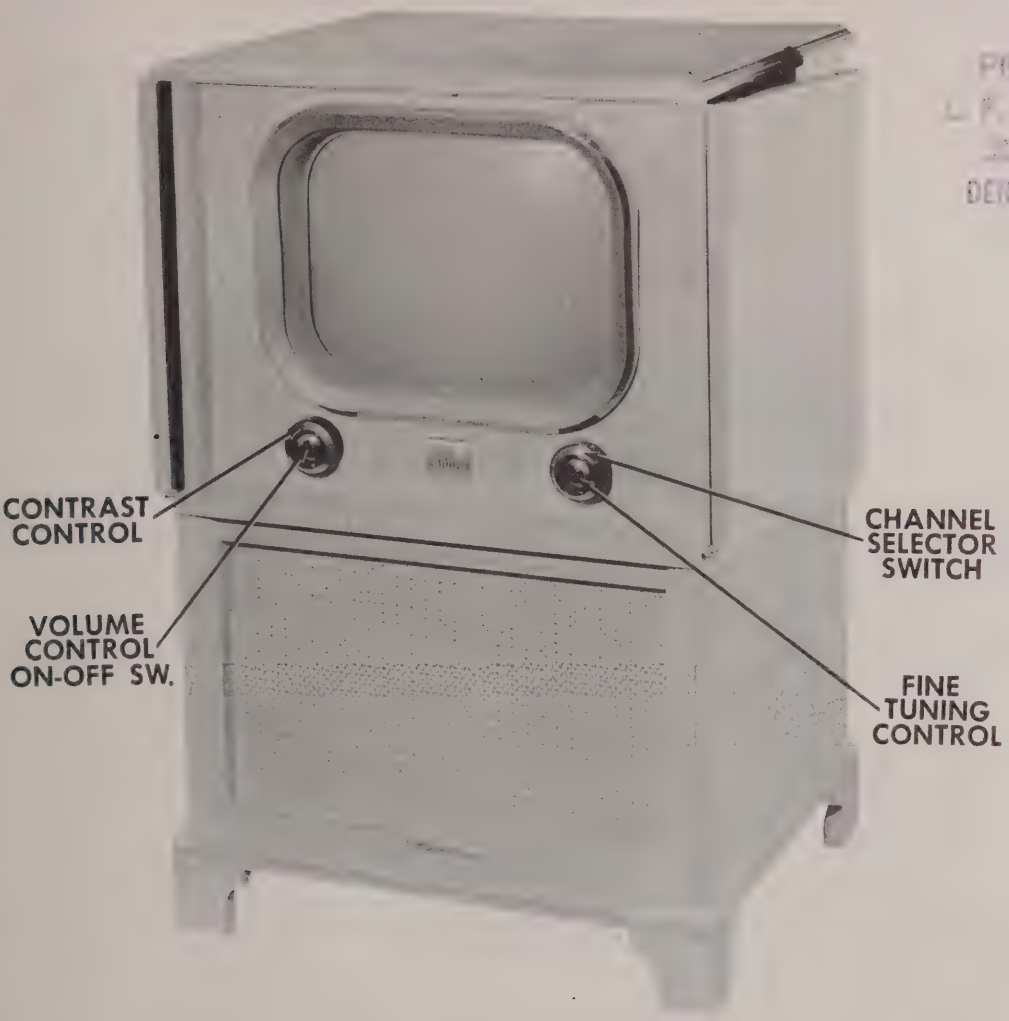

MOTOROLA 17K9BC

TRADE NAME	Motorola Models 17K5E (Ch. TS-221-A), 17K9, B (Ch. TS-220), 17K9BC, 17T3G, 17T4E (Ch. TS221-A)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty One
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.8Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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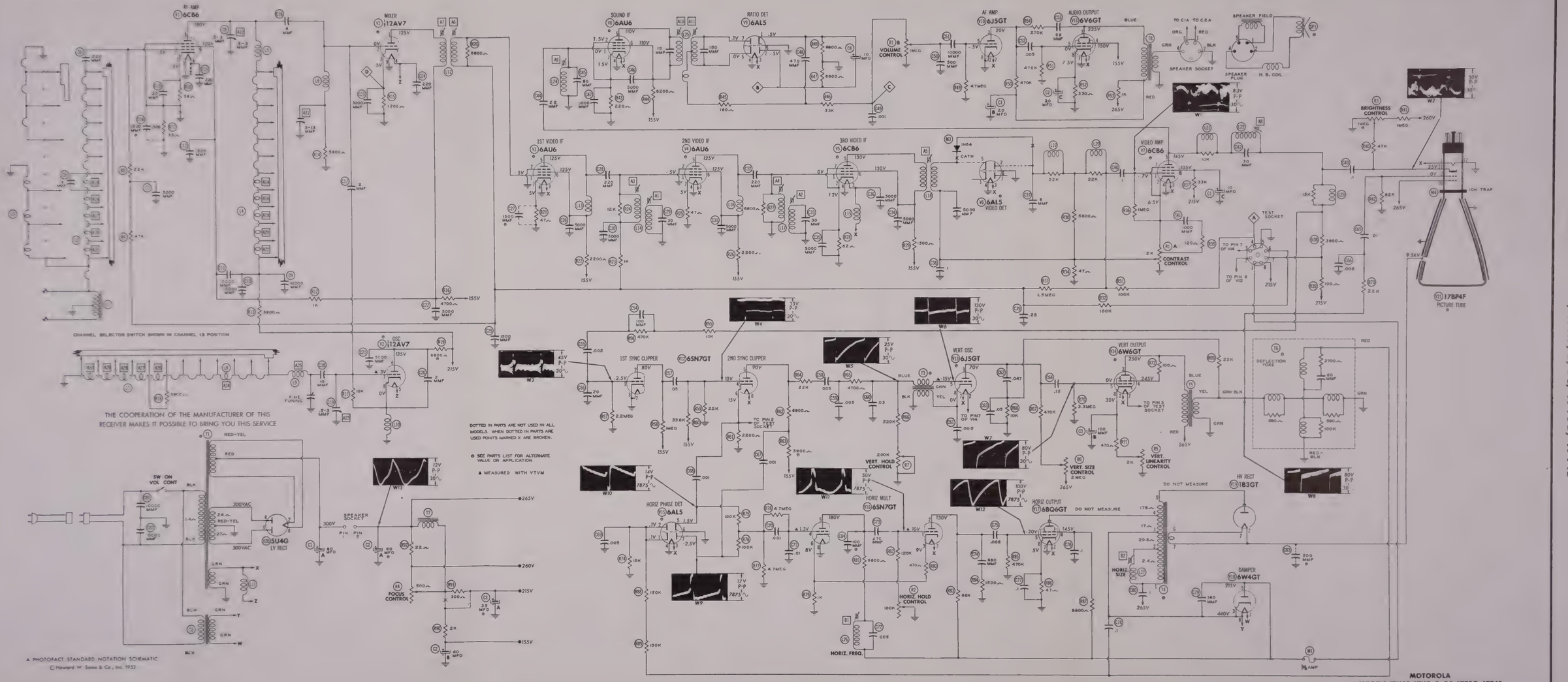
MOTOROLA
MODELS 17K5E, 17K9, B, BC, 17T3G, 17T4E
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
SEE PARTS LIST FOR ALTERNATE VALUE ON APPLICATION
▲ MEASURED WITH VTVM
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA
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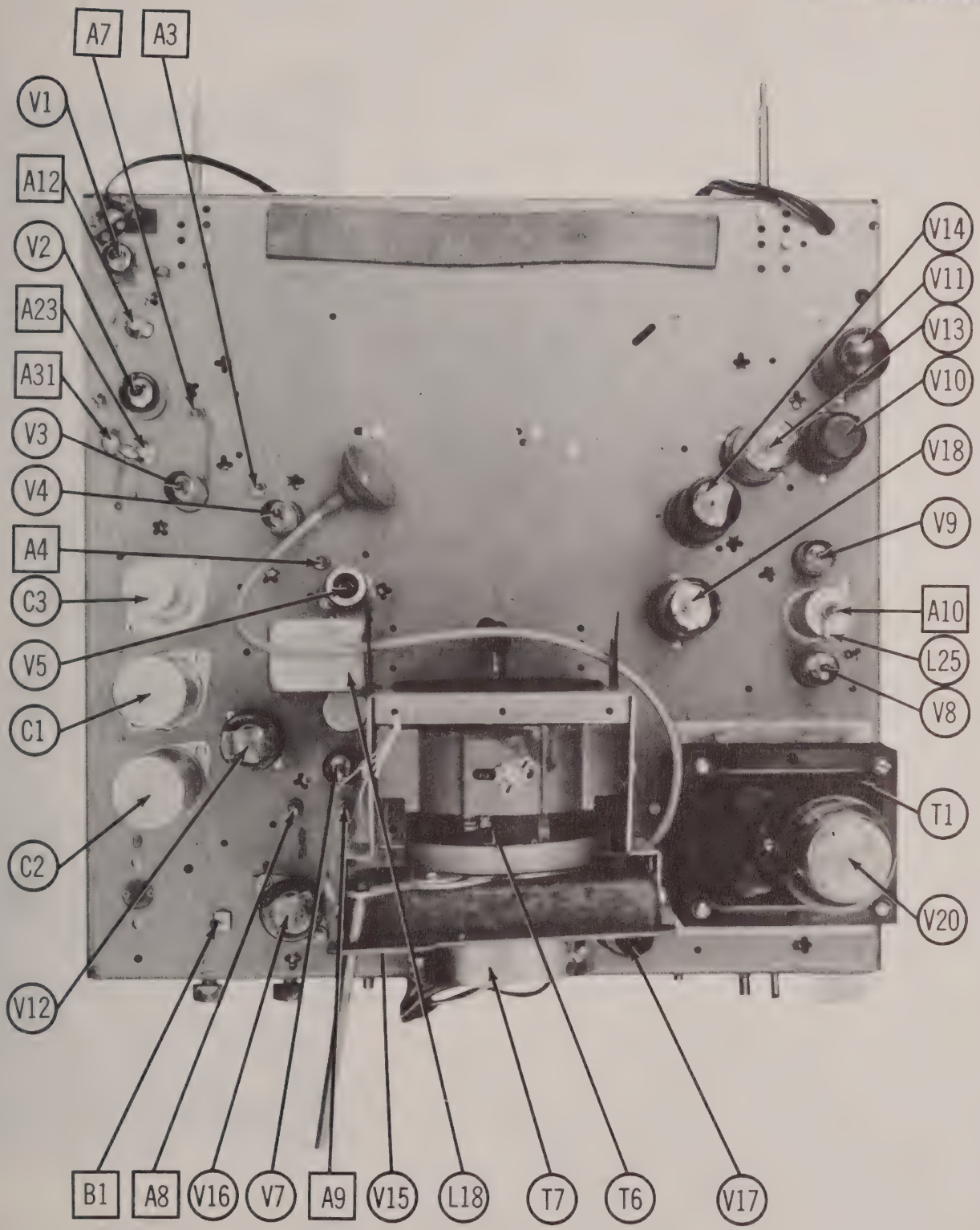
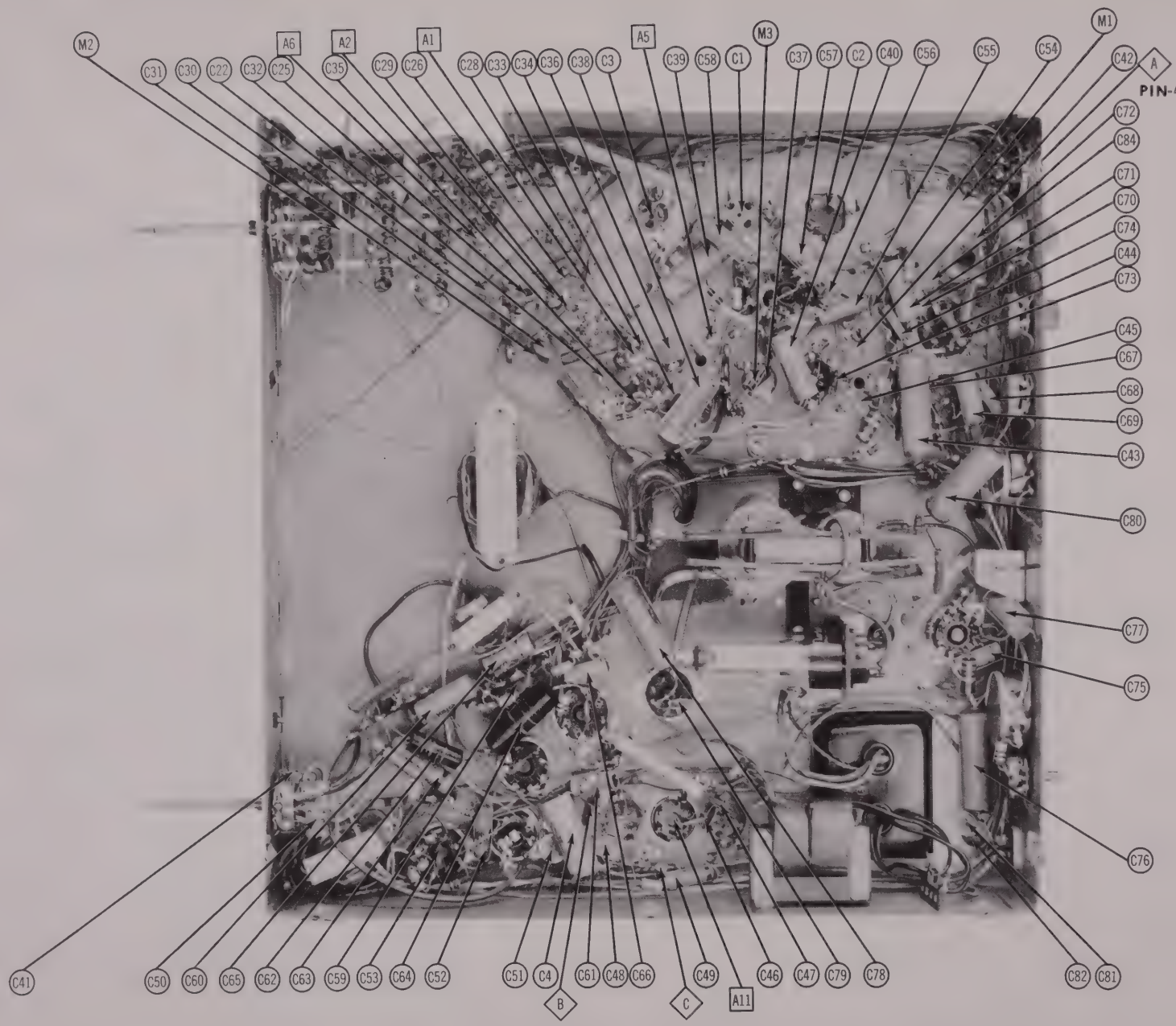


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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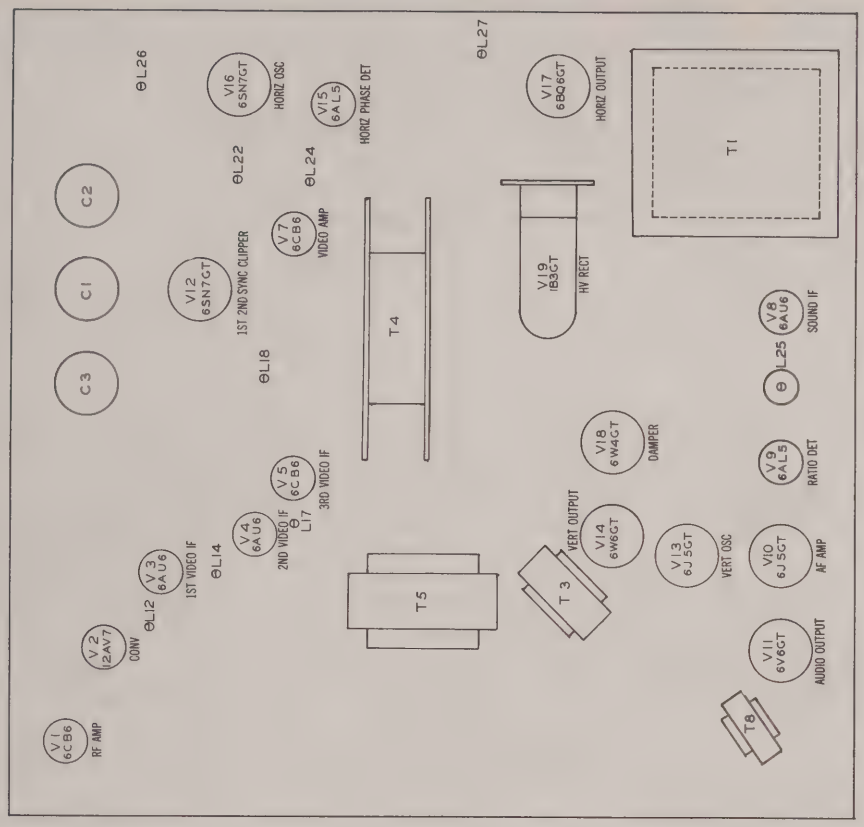
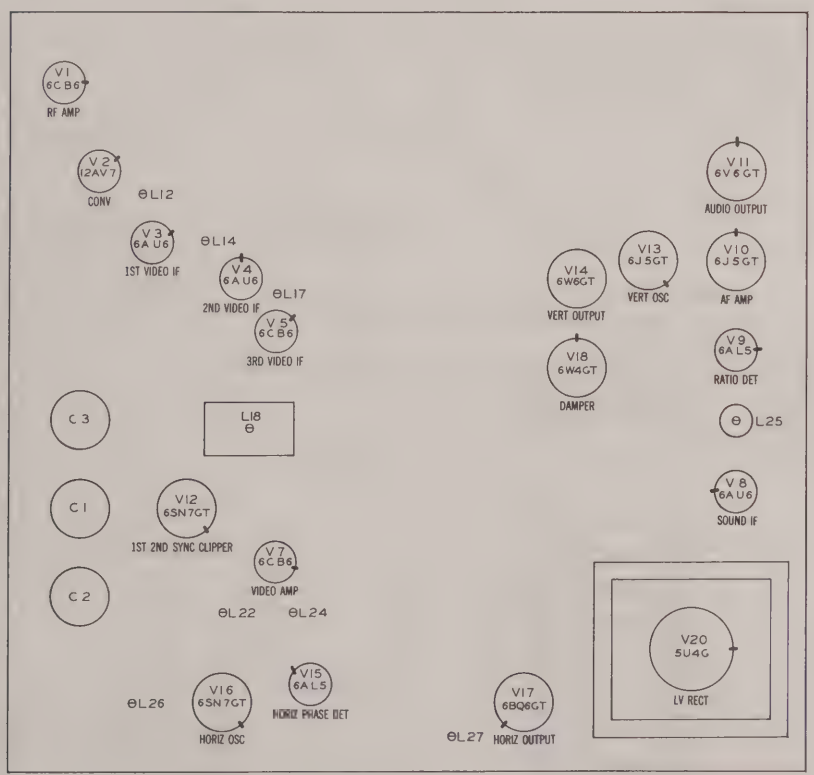


BOTTOM VIEW



TOP VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove the horizontal output tube from its socket and replace it with a 2500Ω, 25W resistor connected between the B+ side fo the fuse and chassis. If the resistor is not available leave the tube in its socket. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Turn the channel switch to a channel which causes no interference.
To check for interference turn the fine tuning control. If the response curve changes switch to another channel.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C39, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	5000MMF	High side to pin 1 (grid), of 6AU6, (V3). Low side to chassis.	24MC (10MC Swp)	21.9MC	See note above	Vert. Amp. to point (A). Low side to chassis.	A1	Adjust for MINIMUM marker indication at the 21.9MC point on response curve.
2	"	"	"	27.3MC	"	"	A2	Adjust for MINIMUM marker indication at the 27.3MC point on response curve.
3.	"	"	"	26.6MC	"	"	A3	Adjust A3 to place 26.6MC marker at 40% on response curve as shown in fig.1.
4.	"	"	"	22.7MC	"	"	A4	Adjust A4 to place 22.7MC marker at 40% on response curve as shown in fig.1.
5.	"	"	"	22.7MC 26.6MC	"	"	A5	Adjust A5 for a flat topped symmetrical response similar to fig.1. Recheck the trap settings.
6.	"	High side to pin 2, (grid) of 12AT7, (V2). Low side to chassis.	"	22.9MC 26.4MC	"	"	A6, A7	Connect a 10000MMF disc capacitor across A31. Turn A6 and A7 both fully out. Adjust both cores simultaneously inward until a response similar to fig.2 is obtained. It is important that the 26.4MC marker fall at 50%. If necessary SLIGHTLY retouch A3 thru A7 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	5000MMF	High side to pin 1, (grid) of 6AH6, (V7). Low side to chassis.	4.5MC (unmod)	Any channel not used locally.	DC probe thru detector, (fig.3) to cathode of picture tube.	A8	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	5000MMF	High side to pin 1 (grid) of 6AH6, (V7). Low side to chassis.	4.5MC (unmod)	Any channel not used locally.	DC probe to point (B). Common to chassis.	A9, A10	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (C). Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	5000MMF	High side to pin 1, (grid), of 6AH6, (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any channel which causes no interference.	Vert. Amp. to point (B). Low side to chassis.	A9, A10	Disconnect stabilizor capacitor C4. Adjust for maximum amplitude and symmetry as per fig. 4.
9.	"	"	"	"	"	Vert. Amp. to point (C) Low side to chassis.	A11	Reconnect capacitor C4. Adjust A11 so 4.5MC occurs at center of crossover lines as per fig. 5. SLIGHTLY retouch A10 for maximum amplitude and straightness of cross over lines.

ANTENNA AND RF ALIGNMENT

Remove the bias battery and connect a short across C39.
Unsolder the end of R19 connected to pin 5 of V2.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 150KΩ to point (D). Low side to chassis.	A12	Adjust for response curve similar to fig. 6 with markers as shown.
11.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	L5	Check all high band channels for response curve similar to fig. 6. If necessary expand or compress turns of L6 for proper response. If L6 is changed repeat steps 10and 11.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
12	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A13 A14	Expand or compress coil turns for response curve similar to fig. 7. with markers as shown. Note that the antenna coils effects the position of the video marker and the RF coil effects the position of the sound marker.
			79MC (10MC Swp)	77.25MC 81.75MC	5		A15 A16	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A17 A18	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A19 A20	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A21 A22	

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Reconnect R19 to pin 5 of V2.
Remove the short from C39 and replace the 3 volt bias battery.
Turn the contrast control to fully counter-clockwise.
Remove the knob from the fine tuning shaftand turn the shaft until the slot is horizontal, which is mid-position of the fine tuning range.
As the oscillator operates below the carrier frequencies on channels 7, 8, 9, and 10 the carrier markers appearing on the response curve will be reversed.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	209.75MC	12	Vert. Amp. to point (A). Low side to chassis.	A23	Adjust to place sound marker in "notch" as shown in fig. 8.
14	"	"	189MC (10MC Swp)	191.75MC	9	"	A24	Expand or compress coil turns to place sound marker in "notch" as shown in fig. 8. Repeat steps 13 and 14 until no further improvement can be made.
15.	"	"	213MC	215.75MC	13	"		Check to see if the sound marker can be placed in the "notch" within 30° rotation of the fine tuning control. If more than 30° rotation is required adjust A25 by expanding coil turns until 30° requirement is met. If A25 is changed recheck A23 in step 13.

16. Recheck channels 7 thru 12 to see if the sound marker for each channel can be placed in the trap "notch" within 30° rotation of the fine tuning shaft. If one of the channels fails to meet the 30° requirement, a compromise must be made by readjusting channel 9 or 12 (as in step 13 or 14) which ever is closer to the channel which is off-frequency. For example: If channel 11 does not meet the 30° requirement turn the channel selector to channel 12 and adjust A23 towards channel 11 (tighten screw). This will move the channel 12 marker out of the "notch" but can be compensated for by adjusting the fine tuning control. Do not adjust A23 further than necessary to bring the channel in question within the 30° requirement. If the channel which is off should happen to be channel 10 turn the channel selector to channel 9 and adjust A24 towards channel 10 (expand turns). This will move the channel 9 marker out of the "notch" but will be compensated for by turning the fine tuning control. Do not alter A24 more than necessary to bring the channel in question within the 30° requirement.

MIXER LC ADJUSTMENTS

Remove the 10000MMF capacitor from across A31. Connect the sweep generator and oscilloscope as in step 6 of Video IF Alignment.
Adjust A31 to the point at which the top of the IF response curve flattens out. Decreasing the capacity of A31 will pull the curve down on the high frequency end, increasing the capacity will pull the curve down on the low frequency end. CAUTION: Tuning the LC circuit very low in frequency will cause oscillation.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω resistor in each lead.	85MC (10MC Swp)	87.75MC	6	Vert. Amp. to point (A). Low side to chassis.	A26	Expand or compress coil turns to place sound marker in notch as shown in fig. 8.
18.	"	"	79MC (10MC Swp)	81.75MC	5	"	A27	Expand or compress coil turns until the marker can be placed in the notch within 15° rotation from center of the fine tuning control range.
19.	"	"	69MC (10MC Swp)	71.75MC	4	"	A28	"
20.	"	"	63MC (10MC Swp)	65.75MC	3	"	A29	Expand or compress coil turns until the marker can be properly placed within 75° rotation from center of the fine tuning control range.
21.	"	"	57MC (10MC Swp)	59.75MC	2	"	A30	"

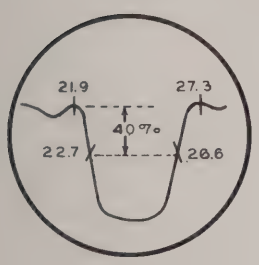


FIG.1

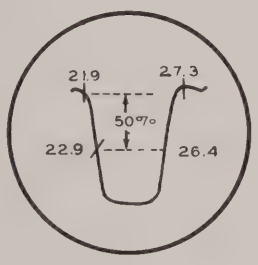


FIG.2

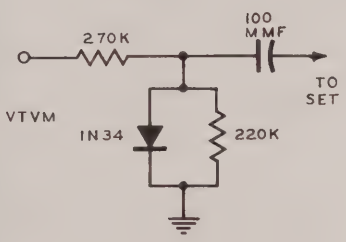


FIG.3

FIG.4

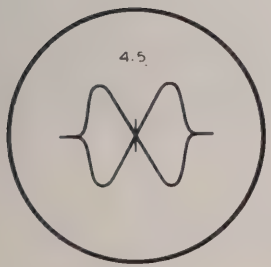


FIG.5

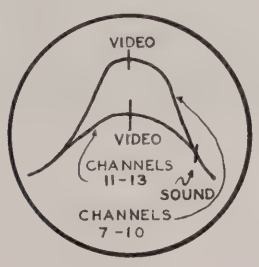


FIG.6

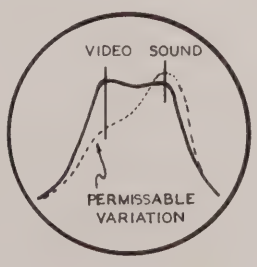


FIG.7

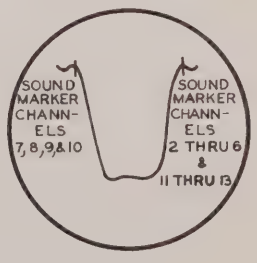
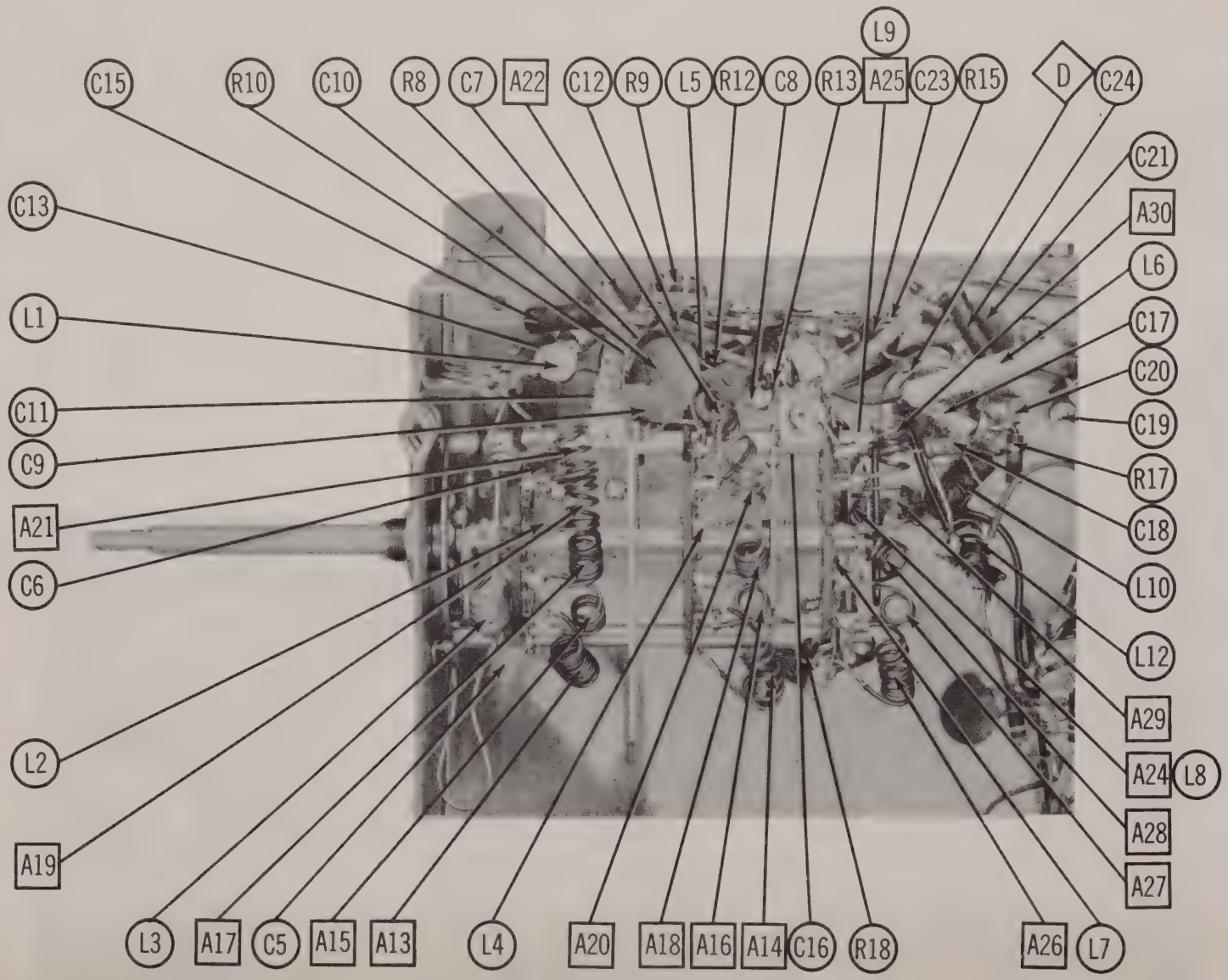


FIG.8

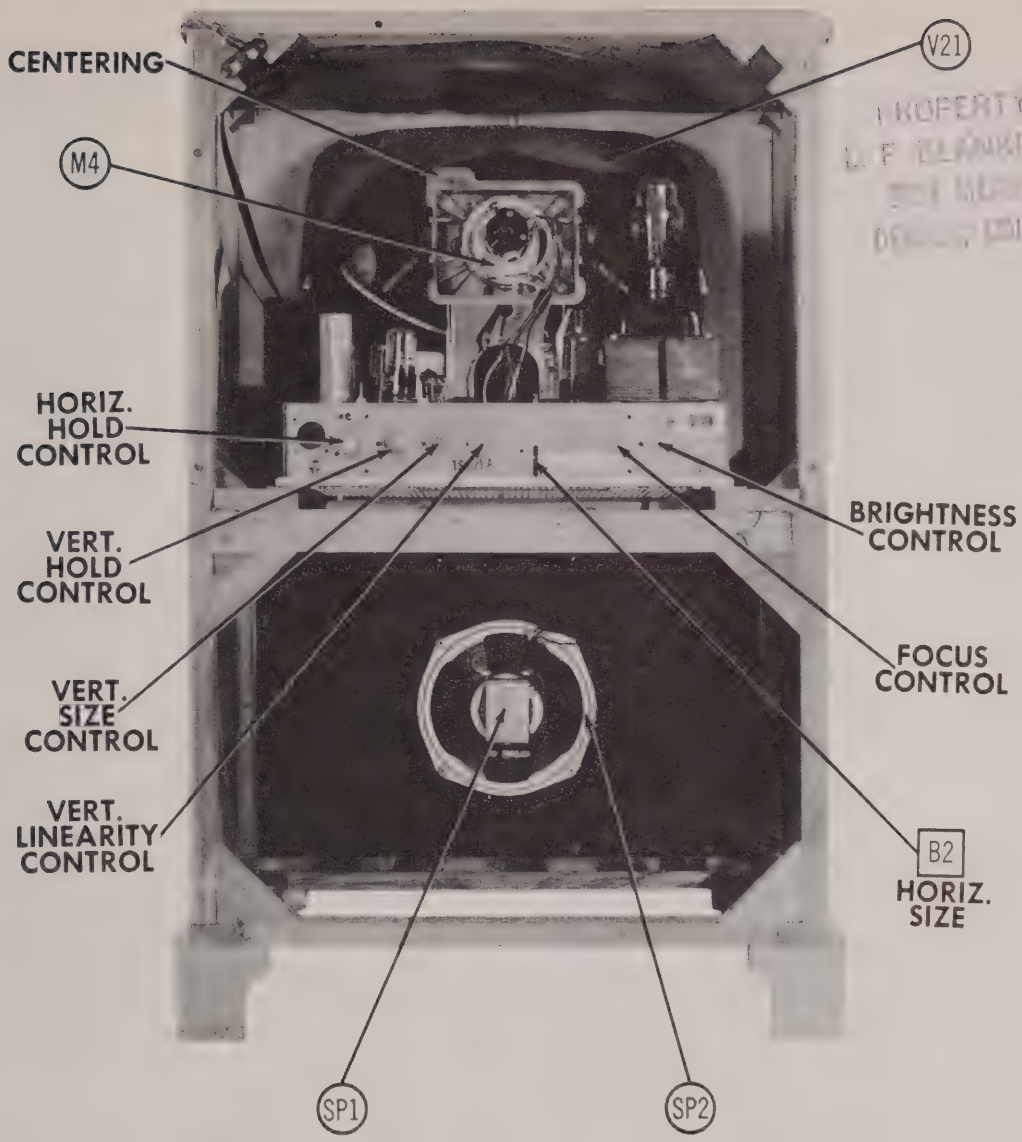
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.6Meg	56Ω	0Ω	.2Ω	†4.3KΩ	†7.8KΩ	0Ω	.	
V 2	12AV7	†6.8KΩ	5.6KΩ	1.2KΩ	.2Ω	.2Ω	†7.2KΩ	10KΩ	1.8Ω	0Ω
V 3	6AU6	1.5Meg	0Ω	.1Ω	0Ω	†4.3KΩ	†4.3KΩ	47Ω		
V 4	6AU6	1.5Meg	0Ω	.1Ω	0Ω	†4.3KΩ	†4.3KΩ	47Ω		
V 5	6CB6	.5Ω	82Ω	.2Ω	0Ω	†3.6KΩ	†3.6KΩ	82Ω		
V 6	6AL5	NOT USED IN ALL MODELS								
V 7	6CB6	1Meg	270Ω	.1Ω	0Ω	†4.4KΩ	†33KΩ	270Ω		
V 8	6AU6	1.1Ω	220Ω	.1Ω	0Ω	†10KΩ	†10KΩ	220Ω		
V 9	6AL5	6.8KΩ	6.8KΩ	.1Ω	0Ω	1Meg	0Ω	1Meg		
V 10	6J5GT	0Ω	0Ω	† 470KΩ	INF	4.7Meg	100KΩ	.1Ω	0Ω	
V 11	6V6GT	0Ω	.1Ω	†1.4KΩ	†2.1KΩ	470KΩ	†740KΩ	0Ω	330Ω	
V 12	6SN7GT	2.2Meg	†1Meg	0Ω	22KΩ	†13KΩ	2.2KΩ	0Ω	.1Ω	
V 13	6J5GT	0Ω	0Ω	†1.4Meg	INF	310KΩ	†950KΩ	.1Ω	68Ω	
V 14	6W6GT	0Ω	.1Ω	†700Ω	†800Ω	3.3Meg	1.1KΩ	0Ω	1.6KΩ	
V 15	6AL5	15KΩ	15KΩ	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 16	6SN7GT	180KΩ	†68KΩ	1.4KΩ	9.4Meg	†7.2KΩ	1KΩ	.1Ω	0Ω	
V 17	6BQ6GT	†68KΩ	.1Ω	INF	†7.2KΩ	470KΩ	INF	9Ω	47Ω	TOP CAP #17Ω
V 18	6W4GT	INF	INF	INF	INF	†410Ω	INF	#.4Ω	#0Ω	
V 19	1B3GT	PIN 1-8 HAVE INF RESISTANCE								TOP CAP #195Ω
V 20	5U4G	INF	40KΩ	INF	24Ω	INF	27Ω	INF	40KΩ	
V 21	17BP4F	.1Ω	82KΩ	PIN 10 †90Ω	PIN 11 180KΩ	PIN 12 0Ω				

ALL CONTROLS SET FOR NORMAL OPERATION- NO SIGNAL APPLIED
† MEASURED FROM PIN 2 OF V20
# MEASURED FROM PIN 3 OF V18



RF TUNER-BOTTOM VIEW



PROPERTY OF
U. F. BLANKENSHIP
DENVER COLORADO

CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to the mid-postion of its range.
Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.
Adjust the width slug, (B2), until the picture is slightly wider than necessary to fill the mask horizontally.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 5 wood screws from back cover. Remove back cover.
3. Remove 2 wood screws and remove antenna strip from cabinet.
4. Disconnect speaker cable.
5. Remove 4 chassis bolts from chassis. Remove chassis.

Note: For picture tube removal it is necessary to remove chassis as outlined above.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6CB6	6CB6	7CM	
V2A	Converter	12AV7	12AV7	9A	
B	Converter	12AT7	12AT7	9A	
V3A	1st Video IF Amp.	6AU6	7BK		
B	1st Video IF Amp.	6AG5	6AG5	7BD	
V4A	2nd Video IF Amp.	6AU6	6AU6	7BK	
B	2nd Video IF Amp.	6AG5	6AG5	7BD	
V5A	3rd Video IF Amp.	6CB6	6CB6	7CM	
B	3rd Video IF Amp.	6AG5	6AG5	7BD	
C	3rd Video IF Amp.	6BC5	6BC5	7BD	
V6	Video Det.	6AL5	6AL5	6BT	Not used in this model- 17K9A
V7A	Video Amp.	6CB6	6CB6	7CM	
B	Video Amp.	6AH6	6AH6	7BK	
V8A	Sound IF Amp.	6AU6	6AU6	7BK	
B	Sound IF Amp.	6AG5	6AG5	7BD	
V9	Ratio Det.	6AL5	6AL5	6BT	
V10	AF Amp.	6J5GT	6J5GT	6Q	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	1st and 2nd Clippers	6SN7GT	6SN7GT	8BD	
V13A	Vert. Osc.	6J5GT	6J5GT	6Q	
B	Vert. Osc.	7N7	7N7	8AC	
V14A	Vert. Output	6W6GT	6W6GT	7AC	
B	Vert. Output	6AS5	6AS5	7CV	
V15A	Horiz. Phase Det.	6AL5	6AL5	6BT	
B	Horiz. Phase Det.	6H6	6H6	7Q	
V16	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rect.	1B3GT	1B3GT	3C	
V20	LV Rect.	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MOTOROLA PART No.	SYLVANIA PART No.	THOMAS PART No.	RTMA BASE TYPE	NOTES
V21A	17BP4F	17BP4A	17BP4	12D	
B	17AP4	17AP4A	17BP4	12D	
C	17CP4	17CP4	17BP4	12D	Used only in chassis TS-220

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	400	23B700613	AFH3-123		UPT840-213D		TVL-4675	▲ Filter ■ Audio Output Dec. ▲ Video Amp. Screen
B	20	300							
C	10	300							
C2A	60	400	23B700614	AFH3-171		UBT640-430C		TVL-3663	▲ Filter † ■ Decoupling ▲ Audio Output Cathode
B	40	300							
C	20	25							
C3A	35	400	23B700615	AFH3-157		UPT2150V10		TVL-1725	■ Decoupling † ▲ Vert. Output Cathode
B	100	50						TVA-1310	
C4	10	50	23A90205	PRS50/10		BR105		TVA-1304	Stabilizing Cap.
C5	8		21K478234				NP0K-080		Fixed Trimmer
C6	220		21K77375	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	RF Coupling
C7	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C8	.5-3		1X701662		829-3				Variable Trimmer
C9	10000		21K482726	BPD-01	DD-103	1D3S1	821-01	5HK-S1	RF Amp. Plate Dec.
C10	10000		21K482726	BPD-01	DD-103	1D3S1	821-01	5HK-S1	RF Amp. Plate Dec.
C11	10000		21K482726	BPD-01	DD-103	1D3S1	821-01	5HK-S1	RF Amp. Screen Bypass
C12	1500		21A470790	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Amp. Screen Bypass
C13	20		21K470322		TCN-20		N750K-200		RF Amp. Cathode
C14	1500		21A470790	SI1500	D6-152	1W5D15	801-0015	5HK-D15	RF Amp. Cathode *
C15	220		21K77375	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	RF Amp. Fil.
C16	6		21K470324				NP0K-060		RF Coupling
C17	2		21K478280				N330K-020		Osc. Coupling
C18	10		21K400173	SI10	D6-100	5W5Q1	GP1K-100	5GA-Q1	Osc. Grid Cap.
C19	.5-3		1X701662		829-3				VariaNe Trimmer
C20	3		21K478280				N330K-020		Osc. Feedback
C21	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Osc. Plate Dec.
C22	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Mixer Plate Dec.
C23	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Mixer Cathode
C24	220		21K77375	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	Conv. Fil.
C25	1500		21A470790	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter
C26	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st Video IF Dec.
C27	1500		21A470790	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st Video IF Cathode *
C28	220		21K77375	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	IF Coupling
C29	30		21K470329				N150K-300		Fixed Trimmer
C30	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C31	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Video IF Dec.
C32	220		21K77375	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	IF Coupling
C33	30		21K470329				N150K-300		Fixed Trimmer
C34	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd Video IF Dec.
C35	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd Video IF Cathode
C36	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd Video IF Fil.
C37	6		21K470324				NP0K-060		Video Det. Filter
C38	.1	200	6R9854		P288-1	DF-104	PTE4P1		2TM-P1 RF Bypass
C39	.25	100	8R9810		P488-25		GT2P25		2TM-P25 AGC Filter
C40	.1	200	6R9854		P288-1	DF-104	PTE4P1		2TM-P1 Video Coupling
C41	1000		21R780599		SI1000	D6-102	1W5D1	GP2L-102	5HK-D1 Video Amp. Cathode
C42	30		21K470329				N150K-300		Fixed Trimmer
C43	.1	600	6R9874		P688-1	DF-104	PTE6P1	6TM-P1	Video Coupling
C44	2.2		21A478274			TCZ-2.2			Sound IF Coupling
C45	60		21K790683				NP0K-2R2 N750K-600		Fixed Trimmer
C46	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Decoupling
C47	5000		21A470789	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Cathode
C48	470	500	21R6590		1468-0005	D6-471	5W5T5	GP2K-471	1FM-35 Diode Load Cap.
C49	.001	600	6R9866		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1 DE-emphasis
C50	500	500	21R6590		1468-0005	D6-501	5W5T5	GP2K-501	1FM-35 RF Bypass
C51	10000		21K482726		BPD-01	DD-103	1D3S1	821-01	5HK-S1 Audio Coupling
C52	.005	600	6R9869		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5 Audio Coupling
C53	68		21R665		SI68	D6-680	5W5Q7	GP1K-680	5GA-Q68 Tone Comp.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	100		21R6574	SI100N750	TCN-100		N750L-101	5TCU-T1	Sync. Coupling
C55	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Sync. Coupling
C56	20		21K470322		TCN-20		N750K-200		Sync. Clipper Grid
C57	.05	600	8R9873	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C58	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Sync. Coupling
C59	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Integrator Net.
C60	.03	600	8R9872	P688-03		PTE6S3		6TM-S3	Vert. Integrator Net.
C61	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Osc. Cathode
C62	.047	400	8R9873	P488-047	DF-503	PTE4S5		4TM-S47	Vert. Discharge
C63	.05	400	8R9873	P488-05	DF-503	PTE4S5		4TM-S47	Vert. Discharge
C64	.15	400	8R9875	P488-15				4TM-P15	Vert. Sweep Coupling
C65	.01	600	8R9870	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Vert. Sweep Coupling
C66	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Integrator Net.
C67	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Sync. Coupling
C68	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Sync. Coupling
C69	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Voltage Divider
C70	.001	600	8R9866	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. AFC Coupling
C71	.01	600	8R9870	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Horiz. AFC Filter
C72	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Fixed Trimmer
C73	270		21K400037	SI270	D6-271	5R5T3	GP2K-271	5GA-T27	Horiz. MV Feedback
C74	680	500	21R2741	1479-0007		2R5T7		MS-37	Horiz. Discharge
C75	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Horiz. Sweep Coupling
C76	.1	600	8R9874	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Output Screen
C77	.1	200	8R9854	P288-1	DF-104	PTE4P1		2TM-P1	Horiz. Output Cathode
C78	.1	600	6R490263	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling
C79	180	3000	21K700883						Damper Filter
C80	.1	600	8R9874	P688-1	DF-104	PTE6P1		6TM-P1	Damper Filter
C81	10000		21K482726	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Line Filter
C82	10000		21K482726	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Line Filter
C83	500	20000	21A790833	HV20C	TV3-502				HV Filter ¶
C84	100		21R6574	SI-100N750	TCN-100		N750L-101	5TCU-T1	Horiz. Osc. Plate

*Not used in all models
† Some models use 80MFD in this application.
† Some models use 40MFD in this application.
¶ Used in chassis TS-220 only.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	2000Ω	½	18A791705		RTV-116	SBBT-578-S	Contrast Control-Tapped ② 1500Ω & 1750Ω
B	1Meg						Panel
D	Switch						Volume Control and Sw-Rear
R2A	100KΩ	½	18A791574	Q11-128	AG-49-S	B-40	Attach to R1A per instructions.
B	Shaft			Not Req.	FKS-1/4	Not Req.	Horiz. Hold Control
R3A	1Meg	½	18A90147	Q11-137	AG-61-S	B-69	Attach to R2A per instructions.
B	Shaft			Not Req.	RS-2	Not Req.	Brightness Control See Note 1.
R4A	500Ω	4	18K702405			SVP-985	Attach to R3A per instructions.
B	Shaft						Focus Control - Wire Wound
R5A	2000Ω	2	18A702407	W-2000	43-2000	VK-131	Attach to R4A per instructions.
B	Shaft			Not Req.	Not Req.	Not Req.	Vertical Linearity Control - Wire Wound
R6A	2Meg	½	18A702402	Q11-139	AG-83-S	B-75	Attach to R5A per instructions.
B	Shaft			Not Req.	FKS-1/4	Not Req.	Vertical Size Control
R7A	200KΩ	½	18K702902	Q-11-129	AG-52-S	B-46	Attach to R6A per instructions.
B	Shaft			Not Req.	RS-2	Not Req.	Vertical Hold Control
							Attach to R7A per instructions.

Note 1. Some models use brightness control alternate part #18A702401

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA Part No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES All resistors are ± 10% unless otherwise noted
R8	22KΩ	½	6R6056	BTS-22K	RF Amp. Grid
R9	47KΩ 20%		6R6397		AGC Net
R10	56Ω		6R5614		AGC Cathode
R11	33Ω		6R2036		AGC Cathode
R12	1000Ω		6R6229	BTS-1000	AGC Screen
R13	3900Ω		6R5659	BTS-3900	AGC Plate Decoupling
R14	5600Ω		6R6117		Mixer Grid
R15	1200Ω		6R6393	BTS-1200	Mixer Cathode
R16	4700Ω		6R6080	BTS-4700	Decoupling
R17	10KΩ		6R6320		Osc. Grid
R18	3900Ω		6R5659	BTS-3900	Osc. Coil Shunt
R19	6800Ω		6R6038		Osc. Plate See Note 1.
R20	6800Ω		6R6428		1st Video IF Amp. Coil Shunt
R21	47Ω		6R5550		1st Video IF Amp. Cathode
R22	2200Ω		6R6069	BTS-2200	1st Video IF Amp. Decoupling
R23	1000Ω		6R6229	BTS-1000	AGC Network
R24	12KΩ		6R6394		2nd Video IF Amp. Coil Shunt
R25	47Ω		6R5550		2nd Video IF Amp. Cathode
R26	2200Ω		6R6069	BTS-2200	2nd Video IF Amp. Decoupling
R27	6800Ω		6R6428		3rd Video IF Amp. Coil Shunt
R28	82Ω		6R2035	BTS-82	3rd Video IF Amp. Cathode
R29	1500Ω		6R6038	BTS-1500	3rd Video IF Amp. Decoupling
R30	5600Ω		6R6117	BTS-5600	Video Det. Diode Load
R31	100KΩ		6R6031	BTS-100K	Isolation
R32	100KΩ		6R6031	BTS-100K	Isolation
R33	1.5Meg 20%		6R3966	BTS-1.5Meg	AGC Network
R34	47Ω		6R5550		Contrast Control Shunt
R35	120Ω		6R5551	BTS-120	Video Peaking
R36	1Meg 20%		6R6004	BTS-1Meg	Video Output Grid
R37	33KΩ		6R6400	BTA-33K	Video Output Screen
R38	3900Ω	2	6R476012	BTB-3900	Video Output Plate
R39	100Ω		6R6326	BTS-100	Video Output Plate
R40	47KΩ 20%		6R6056	BTS-47K	Picture Tube Cathode
R41	1Meg		6R6004	BTS-1Meg	Voltage Divider
R42	82KΩ		6R5644	BTS-82K	Picture Tube Grid
R43	220Ω 20%		6R3933	BTS-220	Sound IF Cathode
R44	8200Ω		6R2004		Sound IF Amp. Decoupling
R45	180Ω		6R5660		Balancing
R46	33KΩ 20%		6R6012		De-emphasis

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R47	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R48	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R49	4.7Meg 20%	½	6R2122	BTS-4.7Meg	AF Amp. Grid
R50	470KΩ 20%	½	6R6033	BTS-470K	AF Amp. Plate
R51	470KΩ 20%	½	6R6032	BTS-470K	Output Grid
R52	330Ω	½	6R6022	BTS-330	Output Cathode
R53	1000Ω	2	6R476004	BTB-1000	Decoupling
R54	270KΩ	½	6R6414	BTS-270K	Feedback
R55	10KΩ	½	6R6320	BTS-10K	Isolation
R56	470KΩ 20%	½	6R6032	BTS-470K	Isolation
R57	2.2Meg 20%	½	6R6927	BTS-2.2Meg	1st Sync. Clipper Grid
R58	1Meg 20%	½	6R6004	BTS-1Meg	1st Sync. Clipper Plate
R59	22KΩ	½	6R6397	BTS-22K	2nd Sync. Clipper Grid
R60	330KΩ	½	6R2097	BTS-330K	2nd Sync. Clipper Grid
R61	2200Ω	½	6R6069	BTS-2200	2nd Sync. Clipper Cathode
R62	6800Ω	½	6R6428	BTS-6800	2nd Sync. Clipper Plate
R63	3900Ω	½	6R6080	BTS-3900	2nd Sync. Clipper Plate See Note 2.
R64	22KΩ	½	6R6397	BTS-22K	Integrator Network
R65	4700Ω	½	6R6080	BTS-4700	Integrator Network
R66	220KΩ	½	6R6407	BTS-220K	Vert. Osc. Grid
R67	470KΩ 20%	½	6R6032	BTS-470K	Vert. Osc. Plate
R68	10KΩ	½	6R6320	BTS-10K	Vert. Peaking
R69	22KΩ	½	6R6397	BTS-22K	Feedback
R70	3.3 Meg 20%	½	6R2118	BTS-3.3Meg	Vert. Output Grid
R71	470Ω	1	6R3949	BTA-470	Vert. Output Cathode
R72	100Ω 20%	½	6R6018		Parasitic Suppressor
R73	22KΩ	½	6R6397	BTS-22K	Integrator Network
R74	15KΩ	½	6R6477	BTS-15K	AFC Diode Load
R75	100KΩ	½	6R6031	BTS-100K	AFC Diode Load
R76	100KΩ	½	6R6031	BTS-100K	AFC Diode Load
R77	4.7Meg 20%	½	6R2422	BTS-4.7Meg	AFC Diode Load
R78	4.7Meg 20%	½	6R2422	BTS-4.7Meg	AFC Filter
R79	1000Ω	½	6R6229	BTS-1000	Horiz. MV Cathode
R80	470Ω 20%	½	6R3949	BTS-470	Horiz. MV Cathode
R81	6800Ω	½	6R6428	BTS-6800	Horiz. MV Plate
R82	120KΩ	½	6R5631	BTS-120K	Horiz. MV Grid
R83	68KΩ	½	6R6074	BTS-68K	Horiz. MV Plate
R84	1500Ω	½	6R6038	BTS-1500	Horiz. Peaking
R85	470KΩ 20%	½	6R6032	BTS-470K	Horiz. Output Grid
R86	47Ω	1	6R5583	BW-1-47	Horiz. Output Cathode
R87	6800Ω	2	6R5690	BTB-6800	Horiz. Output Screen
R88	150KΩ	1	6R5721	BTA-150K	Horiz. AFC Feedback
R89	150KΩ	1	6R5721	BTA-150K	Horiz. AFC Feedback
R90	2000Ω	10	17K792705	1 3/4A-2000	Filter Wire-Wound
R91	300Ω	15	17K710129	2D-300	Filter Wire-Wound
R92	22Ω	2	17K710128	BW-2-22	Focus Coil Shunt Wire-Wound

Note 1. Some models use a 1500Ω resistor in this application
Note 2. Some models use a 4700Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC	600VCT	5VAC	6.3VAC	25C700161			
	② 1.7A	.235ADC	② 3A	② 8.2A	25K700882 ①			
					25C700169 ①			
					25C701025 ①			
					25C710658 ②			
					25C710656 ②			
					25C710659 ②			
					25C710657 ②			

① Alternate transformer.
② Used only in chassis TS-220

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T2	117VAC	6.3VAC			25B790140	P-6134 ③	P-2944 ③	F0-63 ③
	② .1A	② 1.2A						

③ Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T3	65Ω	300Ω	25K710731		A-3000 ④		Vert. Oscillator Trans.
			25K702800 ①				
T4	218Ω	0Ω	24C792753				Horiz. Output Trans.
	Tapped		24C710636 ① ②				
	② 2.4Ω						
	23Ω						
	40Ω						
T5	590Ω	12Ω	25K701619	A-8113 ④	A-3036 ④	TS0-5	Vert. Output Trans.
T6A	34Ω		24K701136		MDF-71 ⑤		Horiz. Deflection Coils
B	53Ω		24K700776 ⑤				Vertical Deflection Coils
			24K700694 ⑤				
			24K700778 ⑤				
			24K700714 ⑤				
			24K700774 ⑤				
T7	86Ω		24C710661				Focus Coil

① Alternate Transformer
② Used only in Chassis TS-220
③ Drill one new mounting hole.
④ Alternate deflection yoke.
⑤ Remove 100KΩ & 2700Ω Resistor and connect capacitor across half of horizontal winding.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T8	5.3KΩ	3.7Ω	305Ω	.3Ω	25B790686	A-3877	A-2930	R0-8	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	86Ω	3.7Ω	50K703084① ③ 50C489002 ② 50C701615 ② 50K703338 ①		8F86S	① Used in model 17K9BC ② Used in models 17T3G and 17T4E ③ Used in model 17K5E
	CONE DIA.	V. C. DIA.				
SP1B	7 3/8 in.	9/16 in.				

COILS (RF-IF)

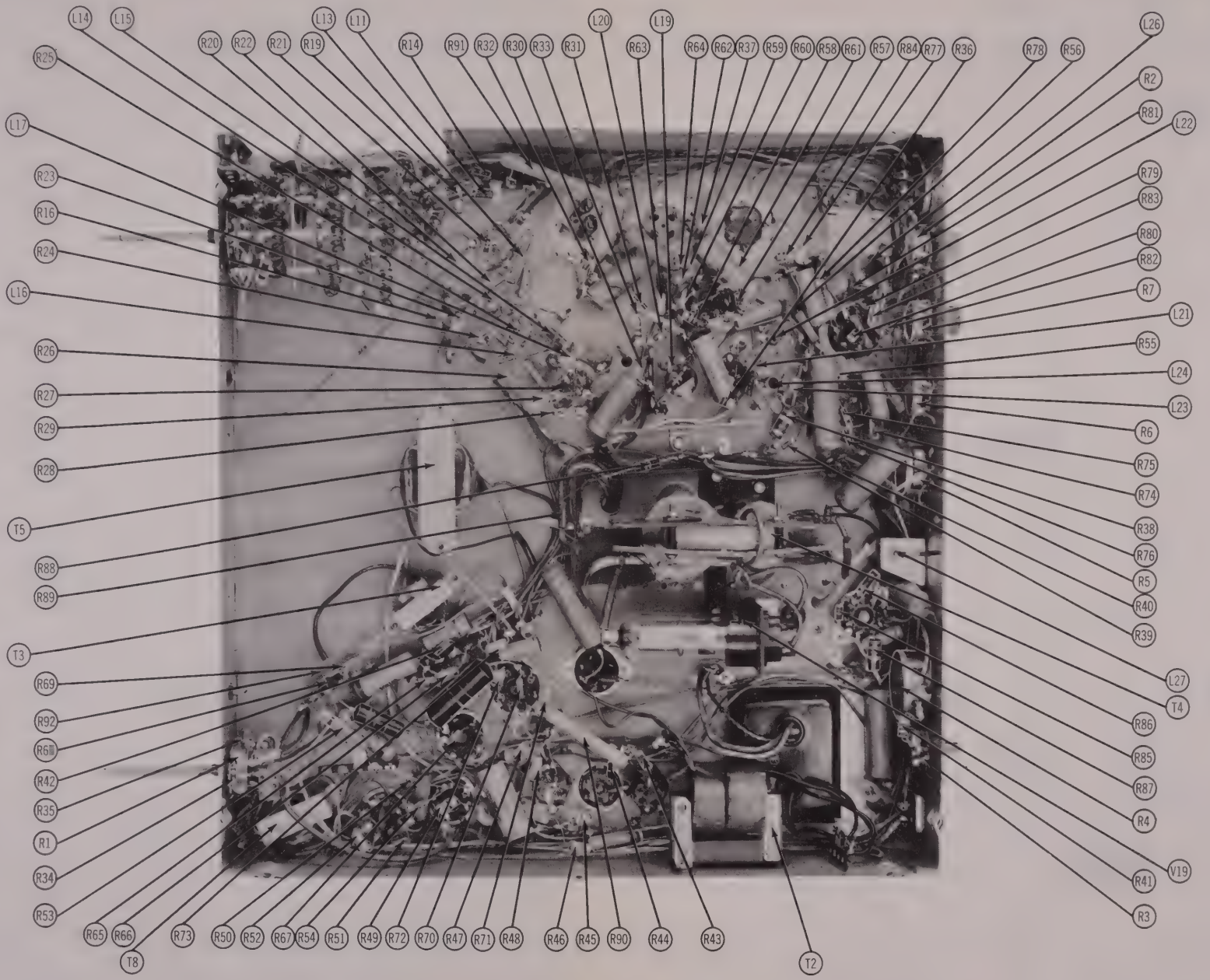
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	MOTOROLA PART No.	MERIT PART No.	IRC PART No.	
L1	Ant. Matching Coil	0Ω		24A790033			
L2	Ant. Coils	0Ω		24C792764			Channels 2 thru 6
L3	Ant. Coils	0Ω		24K792765			
L4	RF Coils	0Ω		24K790536			Channels 2 thru 6
L5	RF Coil	0Ω		24K792825			Channel 13
L6	RF Choke	3Ω		24K792577		CLA	3.3Microhenries
L7	Osc. Coils	0Ω		24C700114			Channels 2 thru 6
L8	Osc. Coil	0Ω		24K700115			Channel 10
L9	Osc. Coil	0Ω		24K700116			Channel 13
L10	Cath. Choke	1.8Ω		24K780128		CLA	2.2Microhenries
L11	Fil. Choke	.22Ω		24K790145		CLA	.47Microhenries
L12	1st Video IF	.4Ω	.2Ω	1X792591			
L13	RF Choke	4Ω		24K790035		CL-1	5.6Microhenries
L14	2nd Video IF	.3Ω		24B701343			Includes Trap
L15	Fil. Choke	.22Ω		24K790145		CLA	.47Microhenries
L16	RF Choke	4Ω		24K790035		CL-1	5.6Microhenries
L17	3rd Video IF	.4Ω		24K701344			Includes Trap
L18	4th Video IF	.6Ω	.6Ω	1X703335			
L19	Peaking Coil	5.4Ω		24K701017			White Dot, Wound on 22KΩ resistor
L20	Peaking Coil	5.4Ω		24K701017			White Dot, Wound on 22KΩ resistor
L21	Peaking Coil	10Ω		24K703073			Red Dot, Wound on 10KΩ resistor
L22	4.5MC Trap	2.2Ω		1X792736			
L23	Peaking Coil	10.5Ω		24K701019			Black Dot, Wound on 15K resistor
L24	Sound IF	1Ω		1X790341			
L25	Ratio Det.	3Ω	.3Ω	24B790125			Tap at .3Ω
L26	Horiz. Osc.	140Ω		24B790055			
L27	Horiz. Size	8Ω		24B700088			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			MOTOROLA PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	3/8A	65K702901		318.375		

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	RF Tuner	1X700132	
M3A	Crystal	48K710004	(1N64) Video Det.
B	Crystal	48D702302	(1N60) Alternate
C	Crystal	48K702303	(1N60) Alternate
D	Crystal	48K710005	CK706 Alternate
M4	Ion Trap		
	Knob	36C700886	Channel Selector Models 17K9B, 17T3G and 17T4E
	Knob	36C700733	Channel Selector Model 17K5E
	Knob	36K700887	Contrast- 17K9B, 17T3G and 17T4E
	Knob	36K700734	Contrast- Model 17K5E
	Knob	36C700888	Fine Tuning and Off/on Volume. Models, 17K9B, 17T3G and 17T4E
	Knob	36C700732	Fine Tuning and Off/On Volume. Model 17K5E
	Knob	36K780522	Horiz. and Vert. Holds models 17K9B, 17T3G and 17K5E
	Knob	36A485457	Horiz. and Vert. Holds Model 17T4E



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. I. GLAMKSHIP
2024 MEADE ST.
DENVER, COLORADO

PHONOLA
MODEL TK-236

PHONOLA
MODEL TK-236

TRADE NAME	Phonola Model TK-236	
MANUFACTURER	Waters-Conley Co., Rochester, Minn.	
TYPE SET	AC Operated Audio Amp. with Automatic Record Changer	
TUBES (Two)	Types 12SQ7GT AF Amp., 50L6GT Audio Output	
POWER SUPPLY	110-120 Volts AC	RATING .24 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT (V-M MODEL 950) SEE PHOTOFACT SET #107-FOLDER 13 OR RECORD CHANGER MANUAL CM-3

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

PHONOLA
MODEL TK-236

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		PHONOLA PART No.	STANDARD REPLACEMENT		
V1	AF Amp.	12SQ7GT	12SQ7GT	8Q	
V2	Audio Output	50L6GT	50L6GT	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHONOLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	150		PRS150/80-40		EDL8415C		TVA-3455	Filter (Blue)
B	20	150		-20					Filter (Red)
C	20	25							Output Cathode (Yellow)
C2	.02	200		P488-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C3	.02	200		P488-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C4	.02	200		P488-02	DF-203	PTE4S2		2TM-S2	Audio Output Plate
C5	.06	200		684-06				6TM-S6	Tone Comp.
C6	.06	200		684-06				6TM-S6	Line Isolation

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	PHONOLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	10496	Q13-139	AG-66-Z	AN-76	Volume Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions.
R2A	50KΩ	½	10510	Q13-123	AM-45-W	AN-32	Tone Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-4	Attach to R2A per instructions.

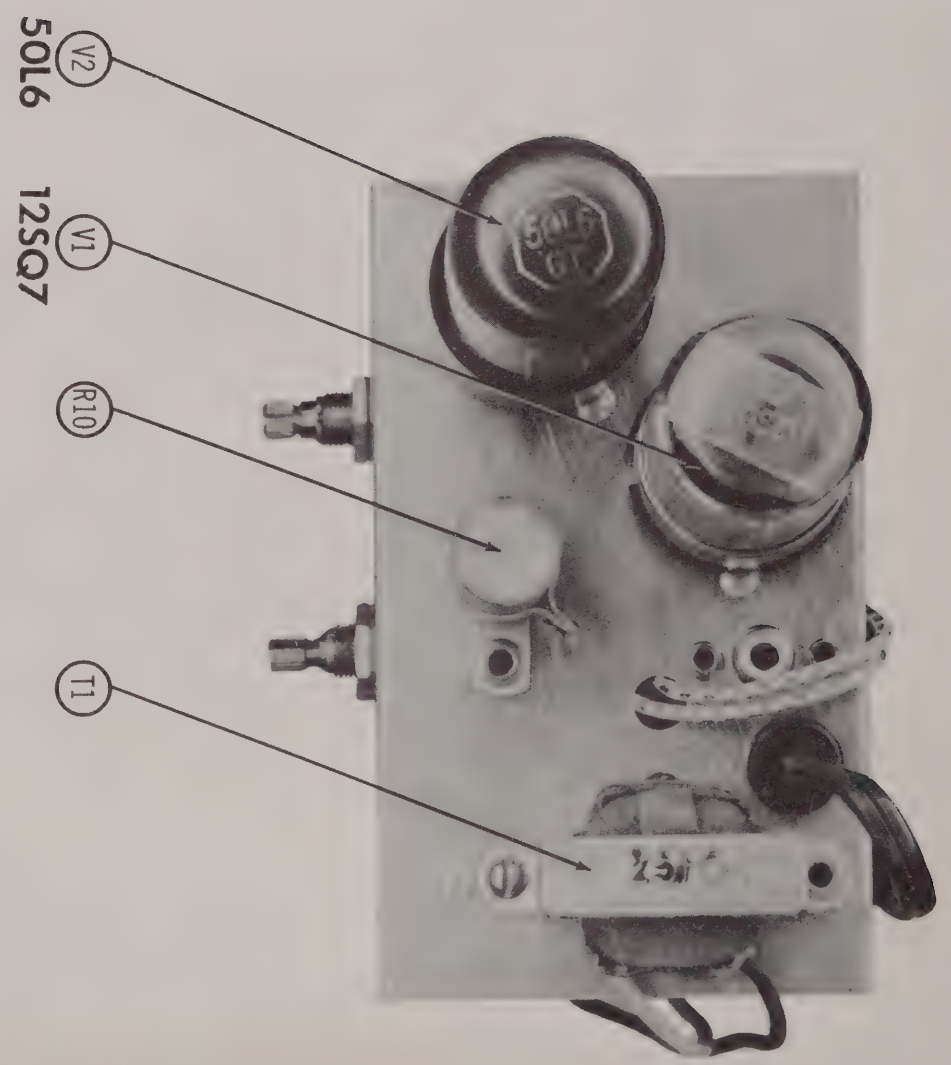
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES All resistors ± 20% unless otherwise noted.
	RESISTANCE	WATTS	PHONOLA PART No.	IRC PART No.	
R3	100KΩ	½		BTS-100K	Series Phono
R4	2.2Meg 10%	½		BTS-2.2Meg 10%	AF Amp. Grid
R5	270KΩ 10%	½		BTS-270K 10%	AF Amp. Plate
R6	470KΩ	½		BTS-470K	Audio Output Grid
R7	150Ω 10%	½		BTS-150 10%	Audio Output Cathode
R8	4700Ω 10%	½		BTS-4700 10%	Filter
R9	39Ω 10%	½			Rectifier Ballast
R10	370Ω	20		2D-350	Series Filament- Wire Wound

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHONOLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.1KΩ	3.2Ω	160Ω	.5Ω		A-3332	A-3025		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.*	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	PHONOLA PART No.	VIKING PART No.	QUAM PART No.	
SP1A	P.M.	3.2Ω		46J6	46A1	
	CONE DIA.	V. C. DIA.				
SP1B	4 in. X6 in.	9/16 in.				

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	PHONOLA PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.048A. DC		NB-5	8J1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	PHONOLA PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2		ACD-J	A-1 A-3	W22AB	A65MG A62A	96	0-1 or S-1 and 0-3 or S-3	

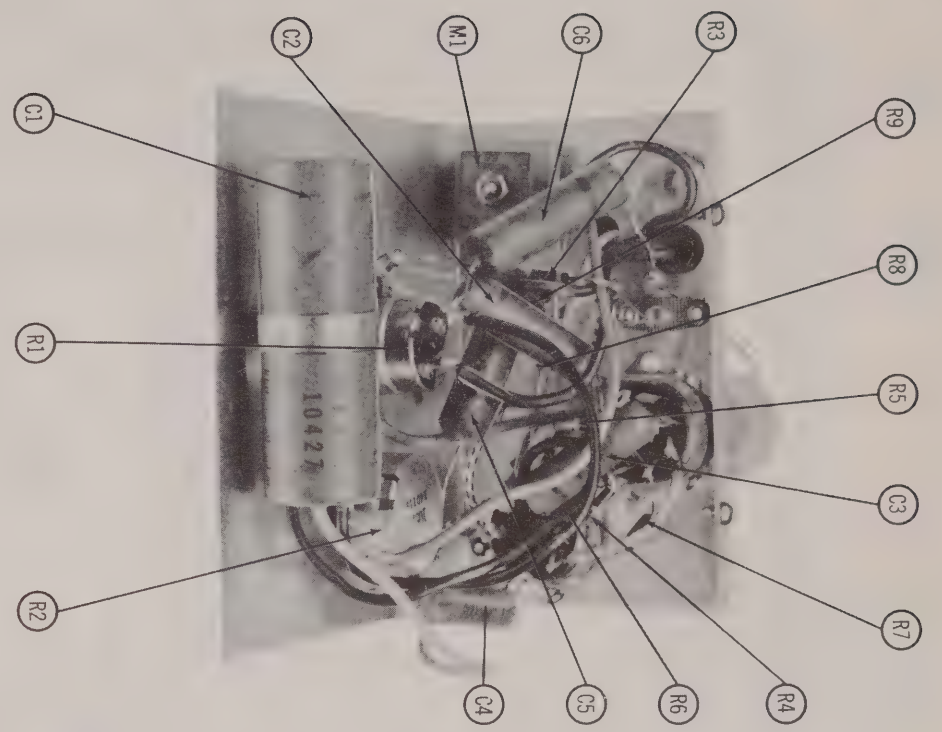
ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

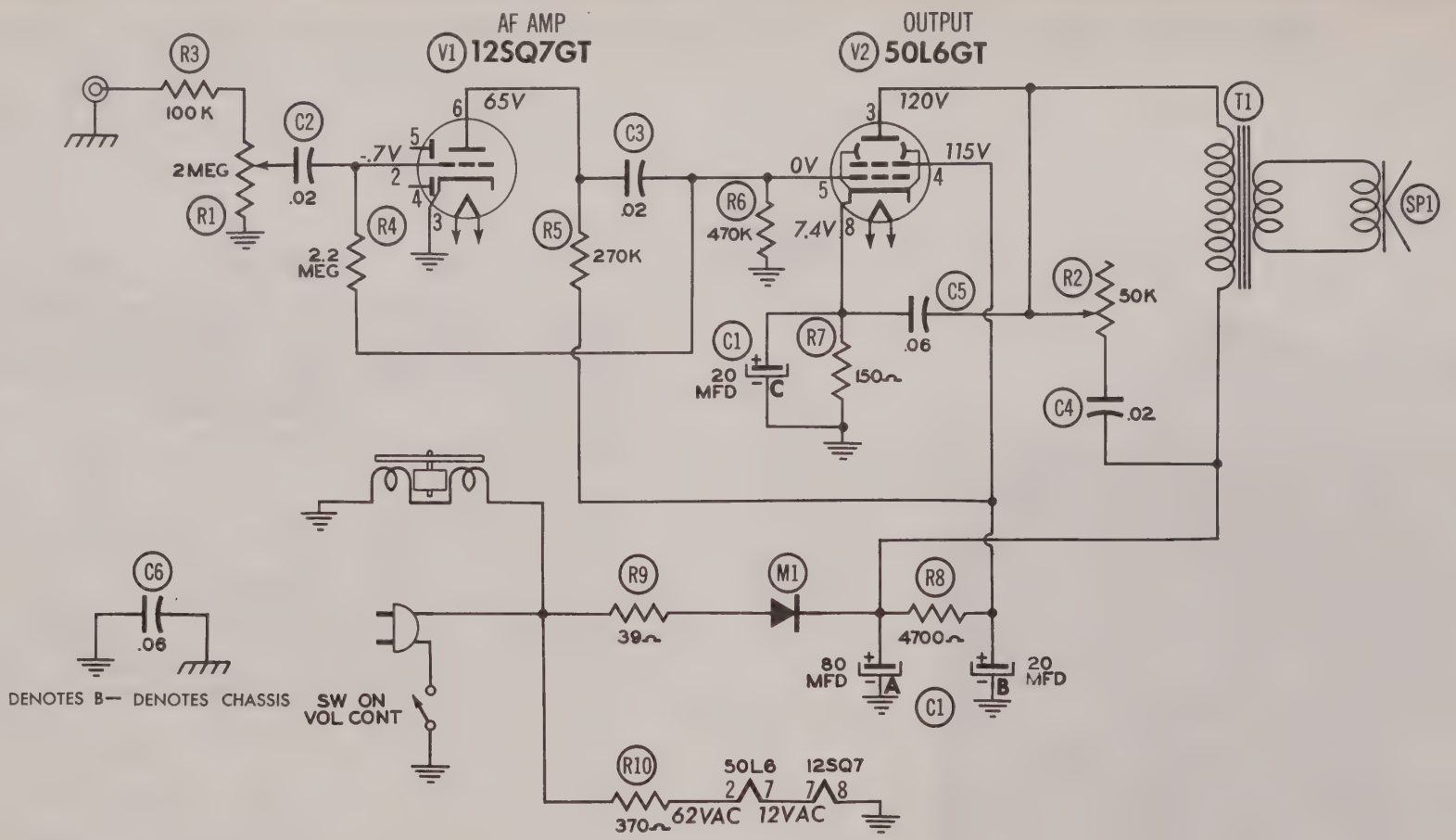
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	PHONOLA PART No.	WALCO PART No.	JENSEN PART No.	
M3		W-10S and W-10MGS	W-14 or W-16 and W-15 or W-17	

CHASSIS—BOTTOM VIEW



PHONOLA
MODEL TK-236



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SQ7GT	INF	2.6KΩ	0Ω	INF	INF	†270KΩ	12Ω	0Ω
V 2	50L6GT	INF	62Ω	†160Ω	†4.7KΩ	470KΩ	INF	12Ω	150Ω

† MEASURED FROM OUTPUT OF M1

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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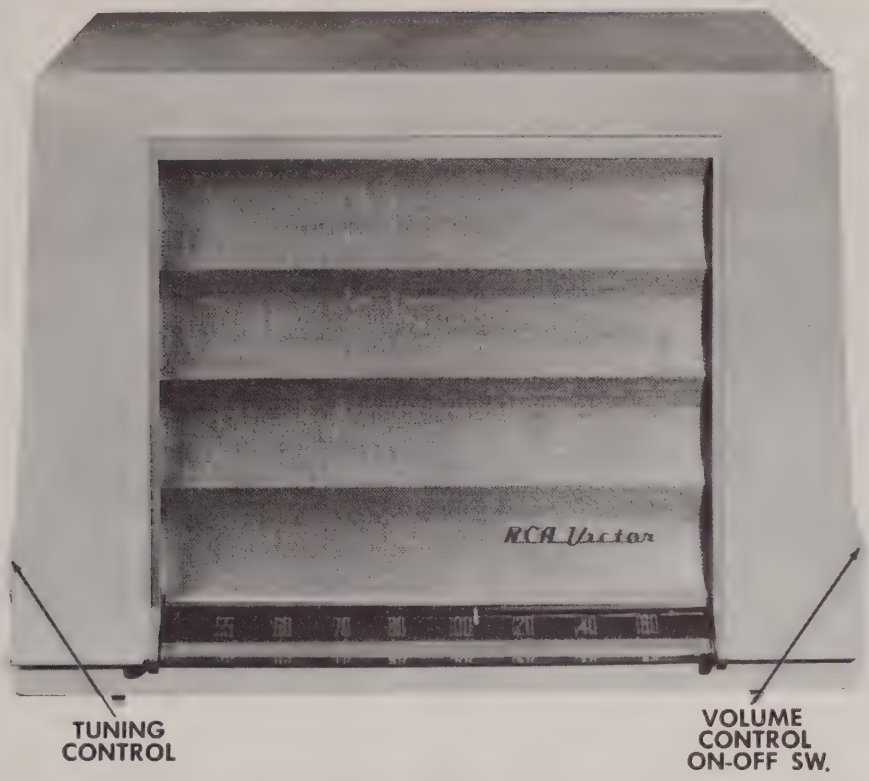
1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

RCA VICTOR
MODELS 1X591, 1X592 (Ch. RC1079K, L)



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DENVER, COLORADO

RCA VICTOR MODEL 1X592

TRADE NAME	RCA Victor Models 1X591 (Ch. RC1079K), 1X592 (Ch. RC1079L)
MANUFACTURER	RCA Victor Div., Radio Corp. Of America, Camden, N. J.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12SA7 Conv., 12SK7 IF Amp., 12SQ7 Det.-AVC-AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC or DC — RATING .27 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set right hand edge of pointer carriage even with the last reference mark at the left hand end of the pointer carriage slide.
Use isolation transformer if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 4, (grid) of 12SK7, (V2). Low side to B-.	455KC (400∿mod)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to stator on RF section of tuning gang. Low side to B-.	"	"	"	A3, A4	"
3.	"	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.	"	Loop	1400KC	Tune for maximum output.	"	A6	"
5.	"	"	600KC	"	"	A7	"

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 1X592

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		RCA PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8R	
V2	IF Amp.	12SK7	12SK7	8N	
V3	Det.-AVC-AF Amp.	12SQ7	12SQ7	8Q	
V4	Audio Output	50L6GT	50L6GT	7AC	
V5	Rect.	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	150	74662	PRS150/80-40		BRD8415		TVA-3455	Filter (Red)
B	50	150							Filter (Green)
C2	56		71924		TCZ-56		NP0-333-560		Osc. Grid Cap.
C3	.047	400	73553	P488-047	DF-503	PTE4S5		4TM-S47	AVC Filter
C4	.1	400	73551	P488-1	DF-104	PTE4P1		4TM-P1	Phono Isolation
C5	.001	600	75643	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Audio Coupling
C6	.0068	400	73789	P488-0068	D6-682		GP2-333-682	6TM-D68	Tone Comp.
C7	.022	400	73562	P488-022	DF-203	PTE4S2		4TM-S22	Audio Coupling
C8	470		75198	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	AF Amp. Plate
C9	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2-333-202	6TM-D22	Audio Coupling
C10	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Output Plate
C11	.047	400	73553	P488-047	DF-503	PTE4S5		4TM-S47	Rectifier Plate
C12	.1	400	73551	P488-1	DF-104	PTE4P1		4TM-P1	Line Isolation

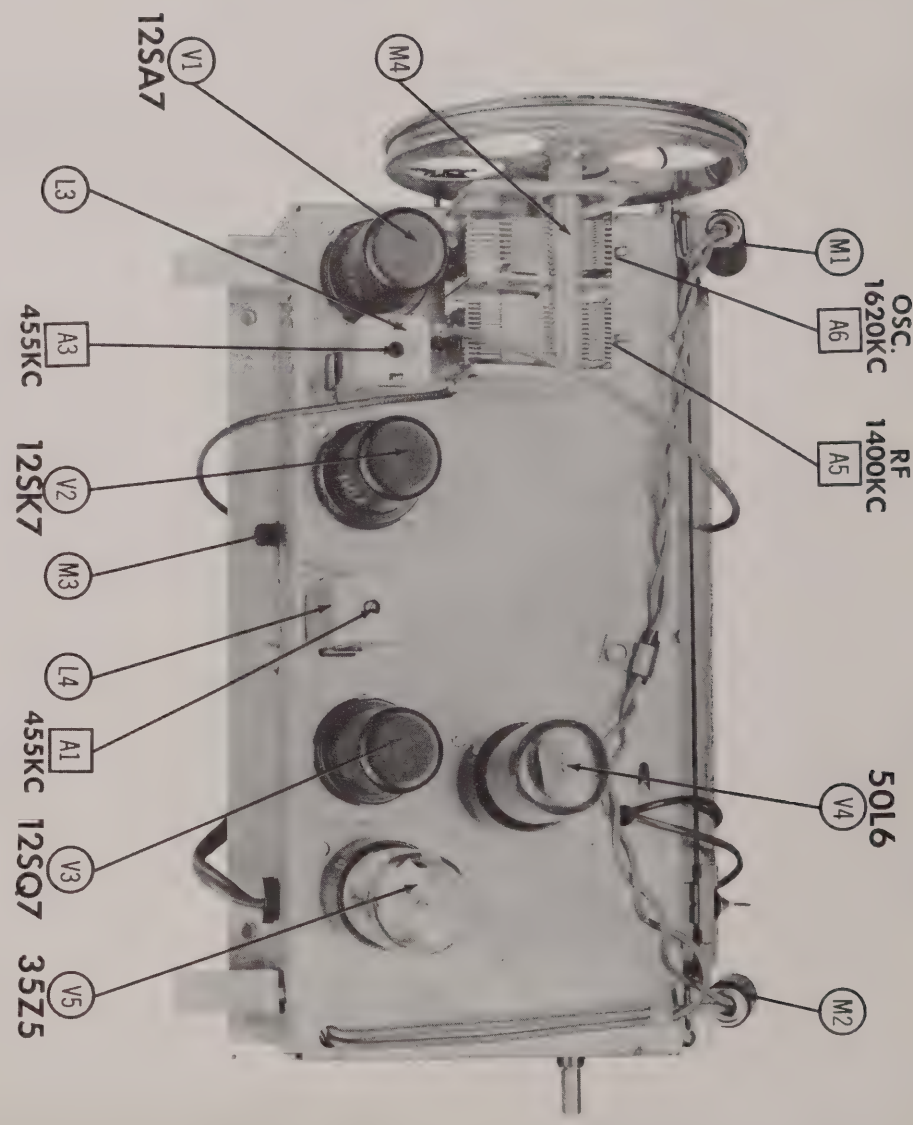
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	74133	Q11-139	AG-83-S	B-75-S	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions.
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	
R2	22KΩ 10%	½	503322	BTS-22K	Osc. Grid
R3	82Ω 10%	½	503082	BTS-82	IF Cathode
R4	10Meg 10%	½	503610	BTS-10Meg	AF Grid
R5	220KΩ 10%	½	503422	BTS-220K	AF Plate
R6	56KΩ 10%	½	503356	BTS-56K	Diode RF Filter
R7	3.3Meg 10%	½	503533	BTS-3.3Meg	AVC Network
R8	47KΩ 10%	½	503347	BTS-47K	Tone Compensation
R9	470KΩ 10%	½	503447	BTS-470K	Output Grid
R10	150Ω 10%	½	503115	BTS-150	Output Cathode
R11	15Ω	½	504015		Surge Limiter
R12	1000Ω 10%	1	513210	BW-1-1000	Filter
R13	220KΩ 10%	½	503422	BTS-220K	Isolation
R14	330KΩ 10%	½	503433	BTS-330K	Diode Load

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	3KΩ	3.9Ω	330Ω Tapped @ 18Ω	.6Ω	74654	A-3330 ①	A-3031 ①	R0-3 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	RCA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P. M.	3.9Ω	76392	ST-115 Mod. P8-V	8A21	
	CONE DIA.	V. C. DIA.				
SP2	7 1/4 in.	9/16 in.	75024			

COILS (RF-IF)

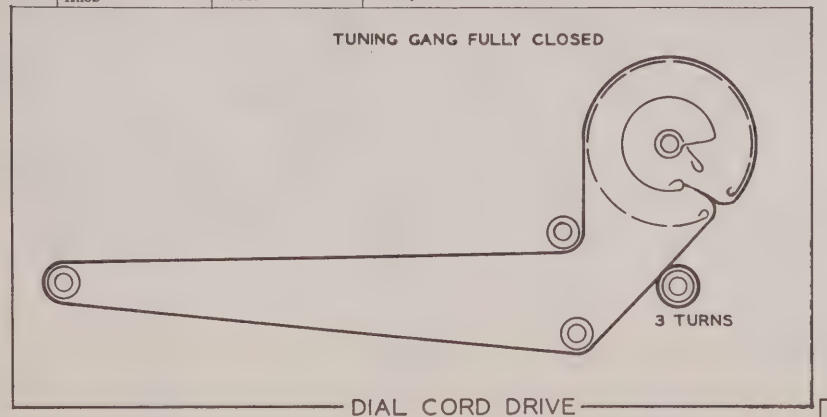
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	RCA PART No.	MERIT PART No.	
L1	Loop Ant.	2.4Ω		76584		
L2	Osc. Coil	.7Ω	4.9Ω	74448		
L3	Input IF	12Ω	12Ω	74918		
L4	Output IF	11.2Ω	12.2Ω	73037		

DIAL LIGHTS

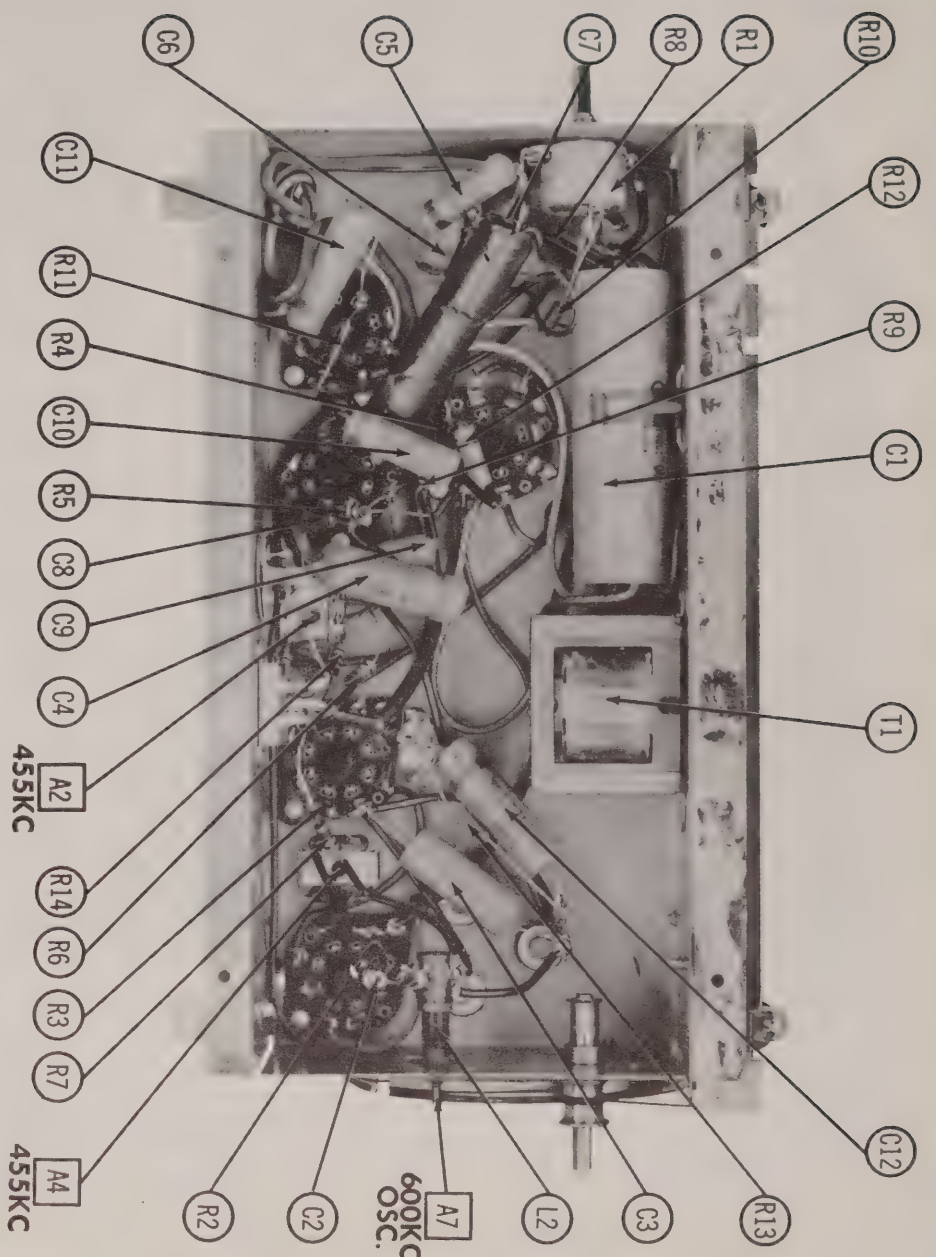
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RCA PART No.		
M1	Bayonet	32	.16	Brown	71116		Type No. 1490
M2	Bayonet	32	.16	Brown	71116		Type No. 1490

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M3	Switch	33634	Radio-Phono
M4	2 Gang Var. Cap.	74653	(27-416MMF, 18-157MMF)
	Cabinet	Y2358	Maroon (1X591)
	Cabinet	Y2359	Ivory (1X592)
	Pointer	76585	
	Dial Scale	76586	
	Knob	74666	Maroon
	Knob	74667	Ivory

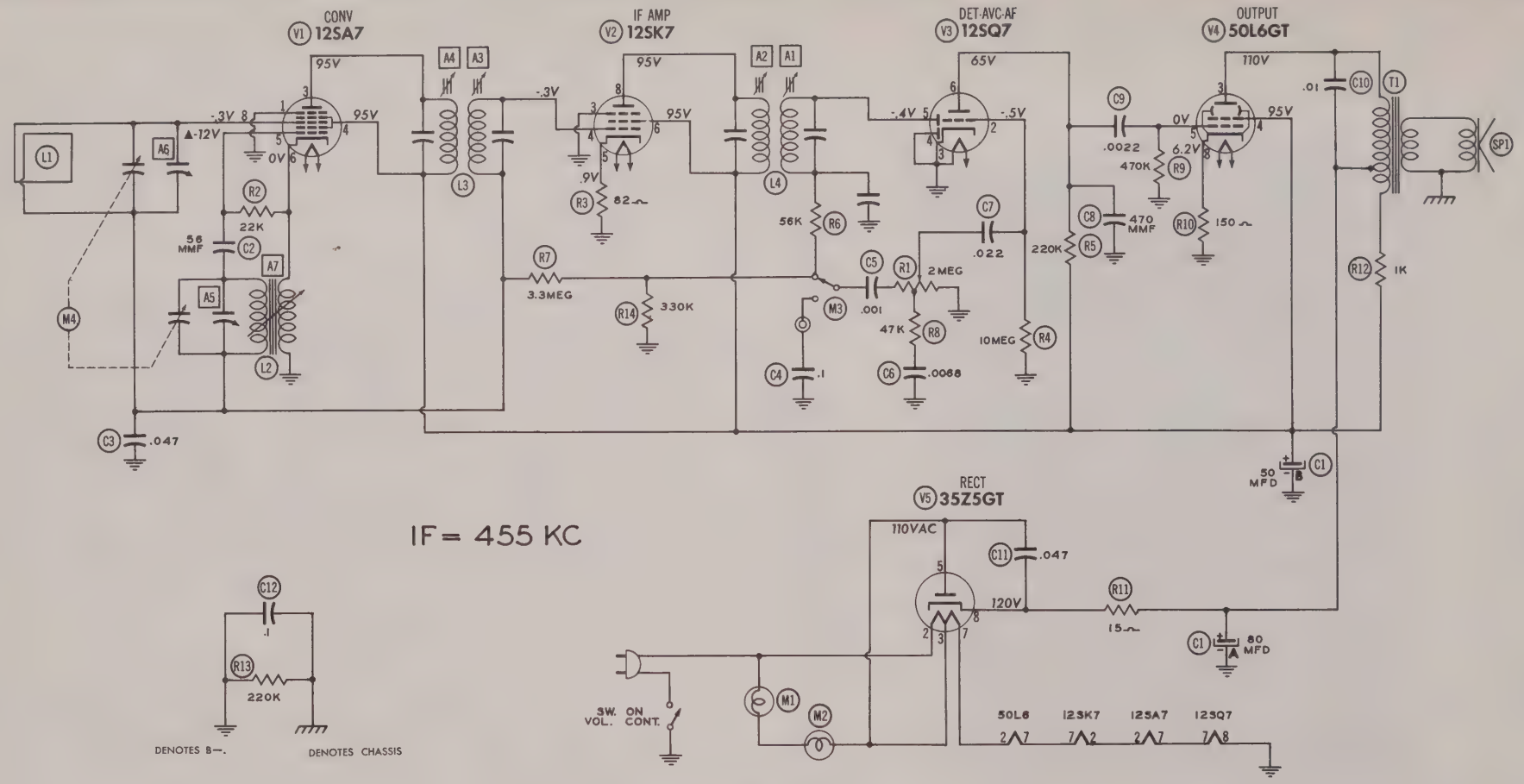


CHASSIS—BOTTOM VIEW



RCA VICTOR MODEL 1X592

RCA VICTOR MODEL 1X592



IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	¶0Ω	24Ω	†1KΩ	†1KΩ	22KΩ	.6Ω	12Ω	3.6Meg
V 2	12SK7	¶0Ω	24Ω	0Ω	3.6Meg	82Ω	†1KΩ	36Ω	†1KΩ
V 3	12SQ7	¶0Ω	10Meg	0Ω	0Ω	385KΩ	†220KΩ	12Ω	0Ω
V 4	50L6GT	INF	86Ω	†345Ω	†1KΩ	470KΩ	†33Ω	36Ω	150Ω
V 5	35Z5GT	INF	12Ω	105Ω	†15Ω	105Ω	INF	86Ω	35KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V5
¶ MEASURED FROM CHASSIS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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159-12

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SYLVANIA MODELS
541 Series, 542 Series (Ch. 1-602-1)

SYLVANIA MODELS
541 Series, 542 Series (Ch. 1-602-1)

SYLVANIA MODEL 542 GR

TRADE NAME	Sylvania Models 541B, H, M, 542BR, CH, GR, RE, YE (Ch. 1-602-1)
MANUFACTURER	Sylvania Electric. Prod., Inc., Colonial Radio and Tel. Div., 254 Rano St., Buffalo, N.Y.
TYPE SET	AC Operated Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC-60 Cycle RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to chassis.	455KC (400~Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1650KC	"	"	A5	"
3.	"	Loop	1450KC	Tune for max. signal.	"	A6	Fashion loops of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

SYLVANIA
MODEL 542GR

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rect.	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	161-2002	PRS150/40-		BRD4415A	-	TVA-2445	Filter (Blue),
B	40	150		40					Filter (Red)
C2	100		166-0100P	SI100	D6-101		GP1K-101	5GA-T1	Osc. Grid Cap.
C3	.01	400	162-0411M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Fixed Padder
C4	.047	200	162-04147	P288-047	DF-503	PTE4S5		2TM-S47	AVC Filter
C5	.0047	600	162-06247	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Coupling
C6	.0047	600	162-06247	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Coupling
C7	.022	400	162-04122	P488-022	DF-203	PTE4S2		4TM-S22	Power Output Plate
C8	.047	400	162-04147	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter
C9	.047	400	162-04147	P488-047	DF-503	PTE4S5		4TM-S47	Line Isolation
C10	.01	400	162-0411M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AVC Filter *

* Not used in all models.

CONTROLS

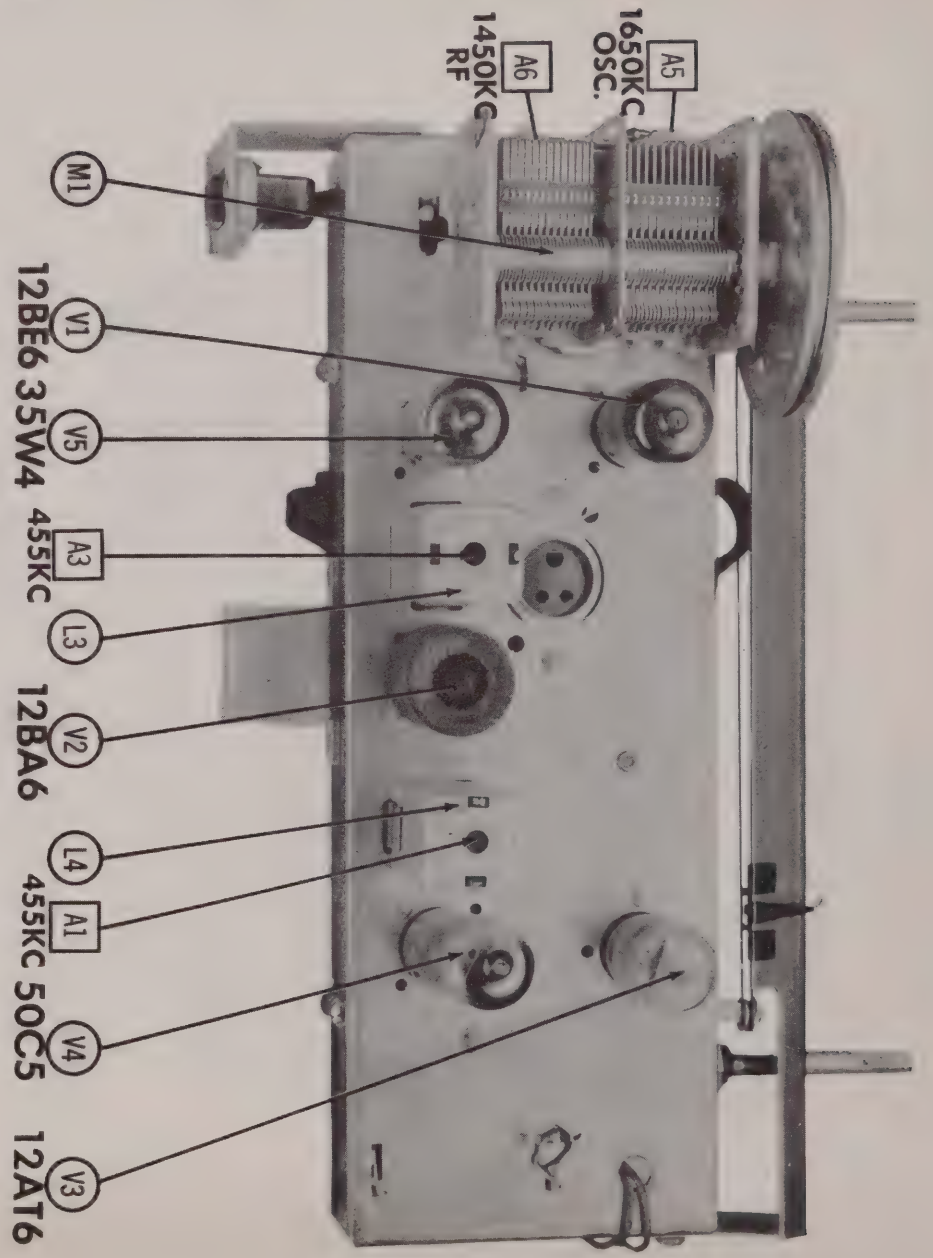
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESIST-ANCE	WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	152-0013	Q13-133	AG-60-Z	B-60-S	Volume Control
B	Shaft		Not Req.	NQ	RS-2	Not Req.	Attach to R1A per instructions.
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SYLVANIA PART No.	IRC PART No.	
R2	22KΩ	½	181-0223	BTS-22K	Osc. Grid
R3	2.2Meg	½	181-0225	BTS-2.2Meg	AVC Network
R4	47KΩ	½	181-0473	BTS-47K	Diode Filter
R5	10Meg	½	181-0106	BTS-10Meg	AF Amp. Grid
R6	47KΩ	½	181-0473	BTS-47K	AF Amp. Plate
R7	470KΩ	½	181-0474	BTS-470K	AF Amp. Plate
R8	470KΩ	½	181-0474	BTS-470K	Output Grid
R9	150Ω	½	181-0151	BTS-150	Output Cathode
R10	1200Ω	1	182-0122	BTA-1200	Filter
R11	25Ω	1	189-0013		Rectifier Ballast- Wire Wound
R12	100KΩ	½	181-0104	BTS-100K	AVC Network - See Note

Note- Not used in all models

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	3KΩ	4.4Ω	190Ω Tapped @ 10Ω	.7Ω	143-0019	A-3330 ①	A-3031 ①	RO-2 ① ②	① Drill new mounting holes. ② Add extra filter to reduce hum level.

SPEAKER

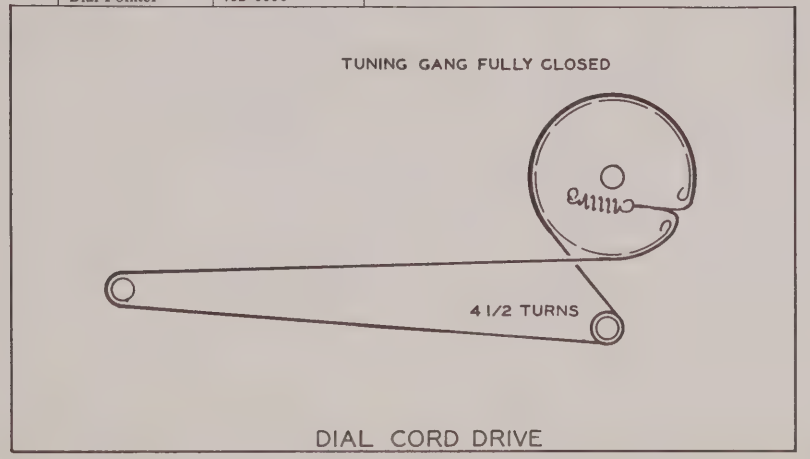
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P. M.	4.4Ω	539-0501	ST-105 Mod. P5-X	5A1	
	CONE DIA.	V. C. DIA.				
SP2	4 7/8 in.	9/16 in.				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SYLVANIA PART No.	MERIT PART No.	
L1	Loop Ant.	3.3Ω		582-0013		
L2	Osc. Coil	9.5Ω		113-0015	BC-381	Tap @ 1.2Ω
L3	Input IF	15Ω	15Ω	121-0016	BC-352	
L4	Output IF	12.2Ω	14.2Ω	122-0018	BC-353	

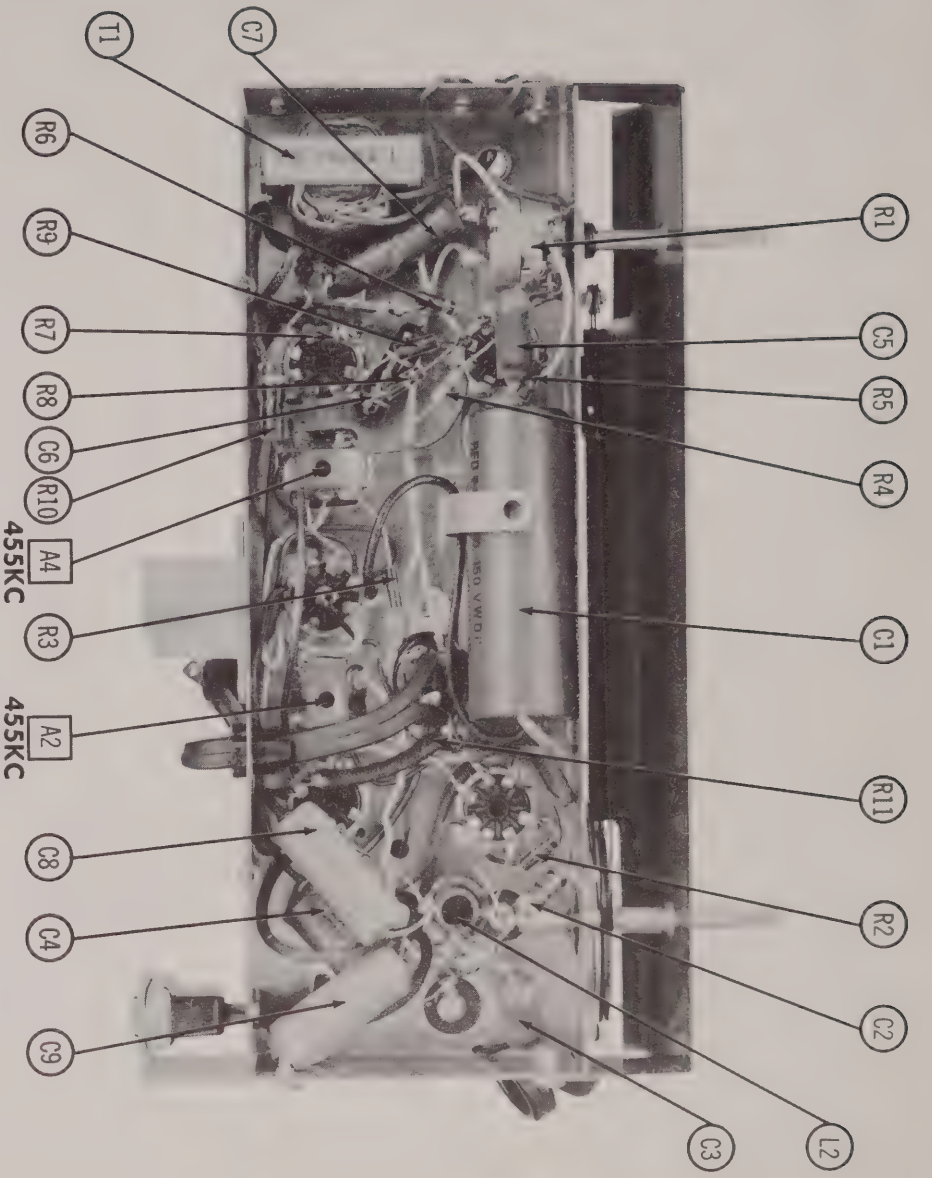
MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M1	2 Gang Var. Cap.	170-0007	(22-422MMF, 28-177MMF)
	Cabinet	813-0008	Black (541B)
	Cabinet	813-0012	Brown (542BR)
	Cabinet	813-0014	Chartreuse (542CH)
	Cabinet	813-0013	Green (542GR)
	Cabinet	813-0021	Ivory (541H)
	Cabinet	813-0010	Mahogany (541M)
	Cabinet	813-0011	Red (542RE)
	Cabinet	813-0015	Yellow (542YE)
	Knob	749-0013	Feature
	Knob	740-0021	Tuning, Vol.-On/Off
	Dial Pointer	792-0006	



DIAL CORD DRIVE

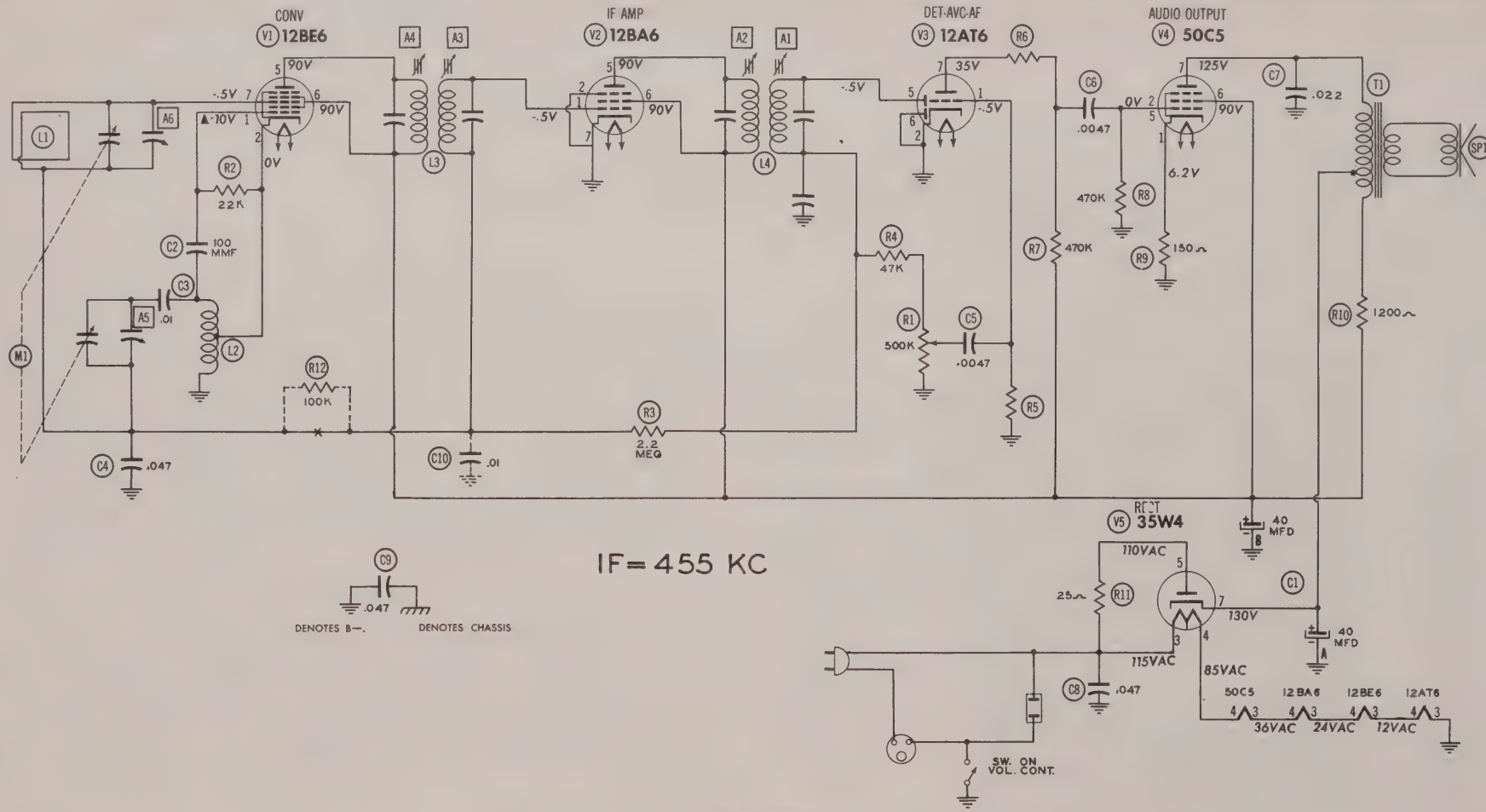
CHASSIS—BOTTOM VIEW



SET 159 FOLDER 13

SYLVANIA MODEL 542GR

SYLVANIA MODEL 542GR



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	1.1Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	0Ω
V 3	12AT6	10Meg	0Ω	0Ω	12Ω	550KΩ	0Ω	†515KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1.2KΩ	†190Ω
V 5	35W4	INF	0Ω	121Ω	86Ω	146Ω	105Ω	40KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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159-13

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

TECH-MASTER
MODEL 1930

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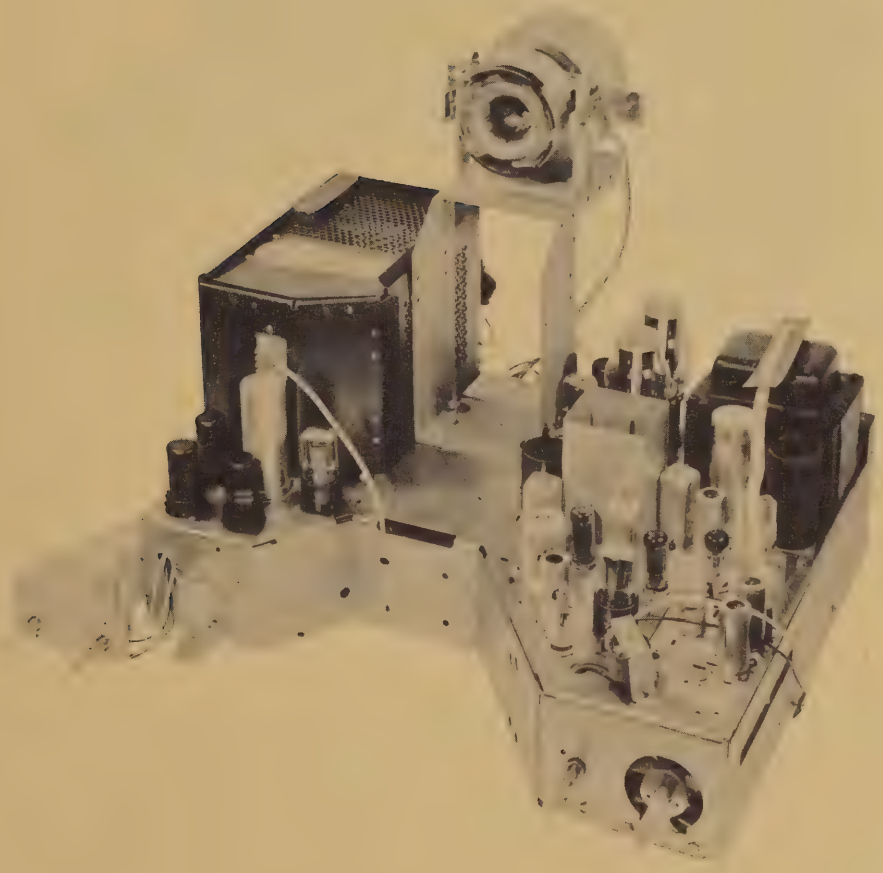

TECH-MASTER
MODEL 1930

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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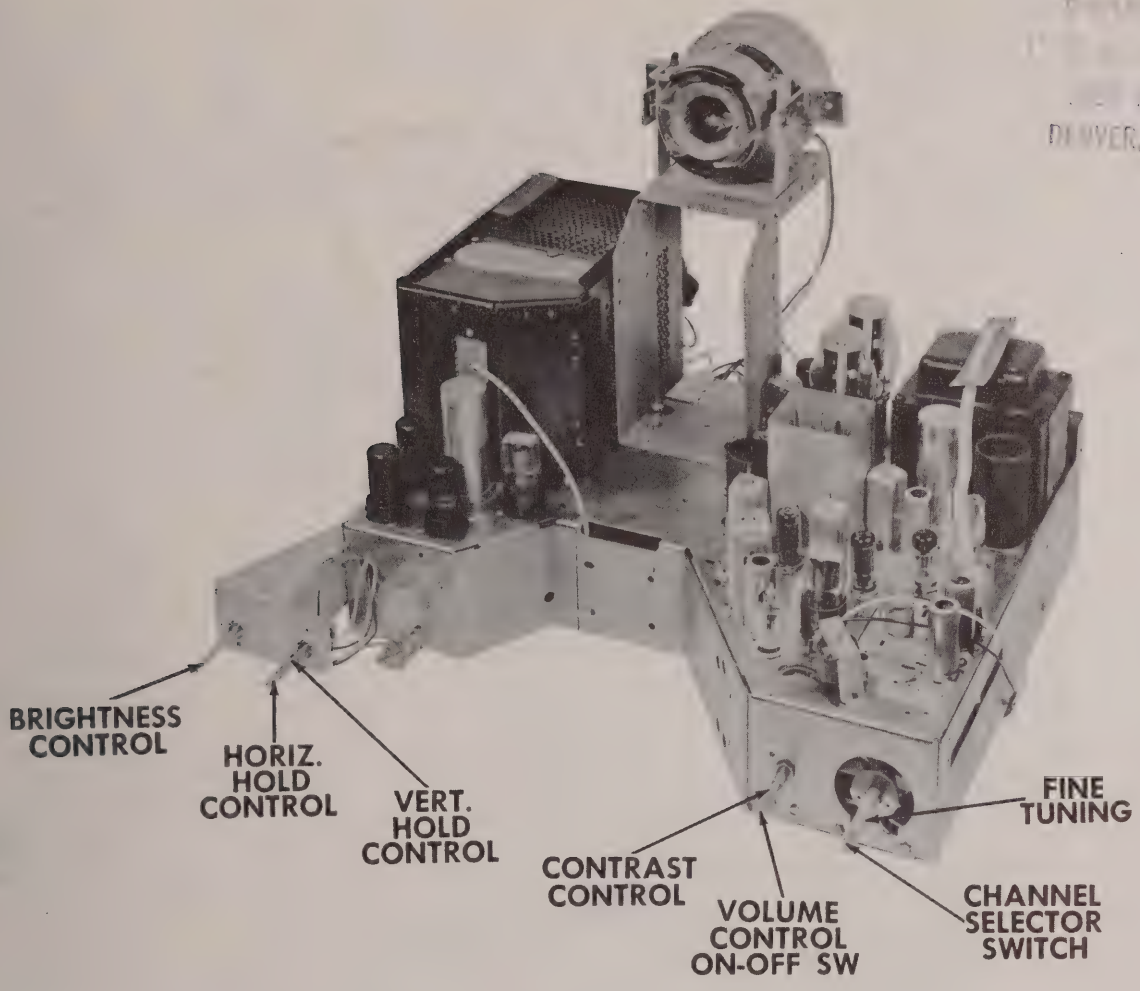
DATE 2-52 SET 159 FOLDER 14



TECH-MASTER
MODEL 1930

TRADE NAME	Tech-Master Model 1930 (Ch. 2430)
MANUFACTURER	Tech-Master Products Co., 443-445 Broadway, New York, N.Y.
TYPE SET	Television Receiver
TUBES	Thirty
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.7Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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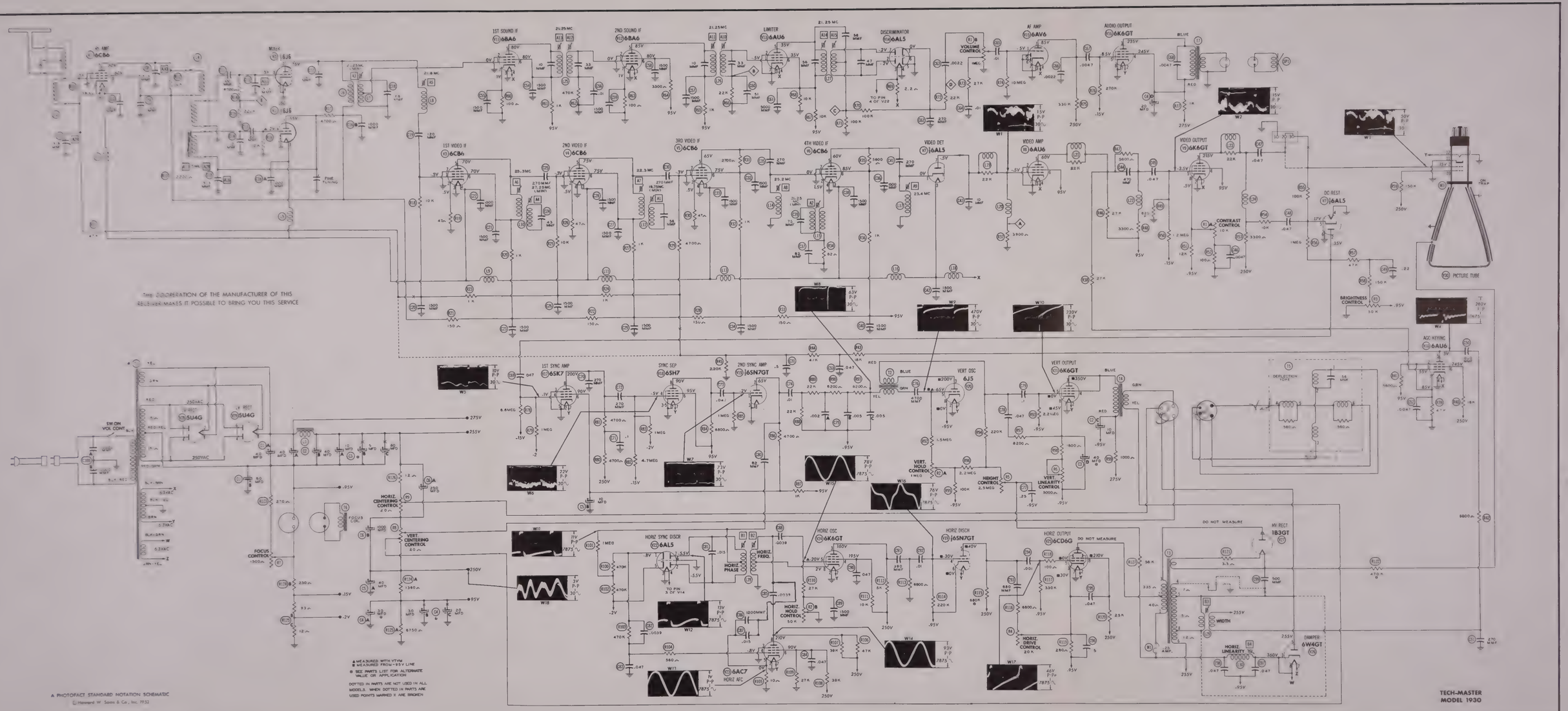

Thru COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

▲ MEASURED WITH VTVM
■ MEASURED FROM +95 V LINE
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TECH-MASTER
MODEL 1930

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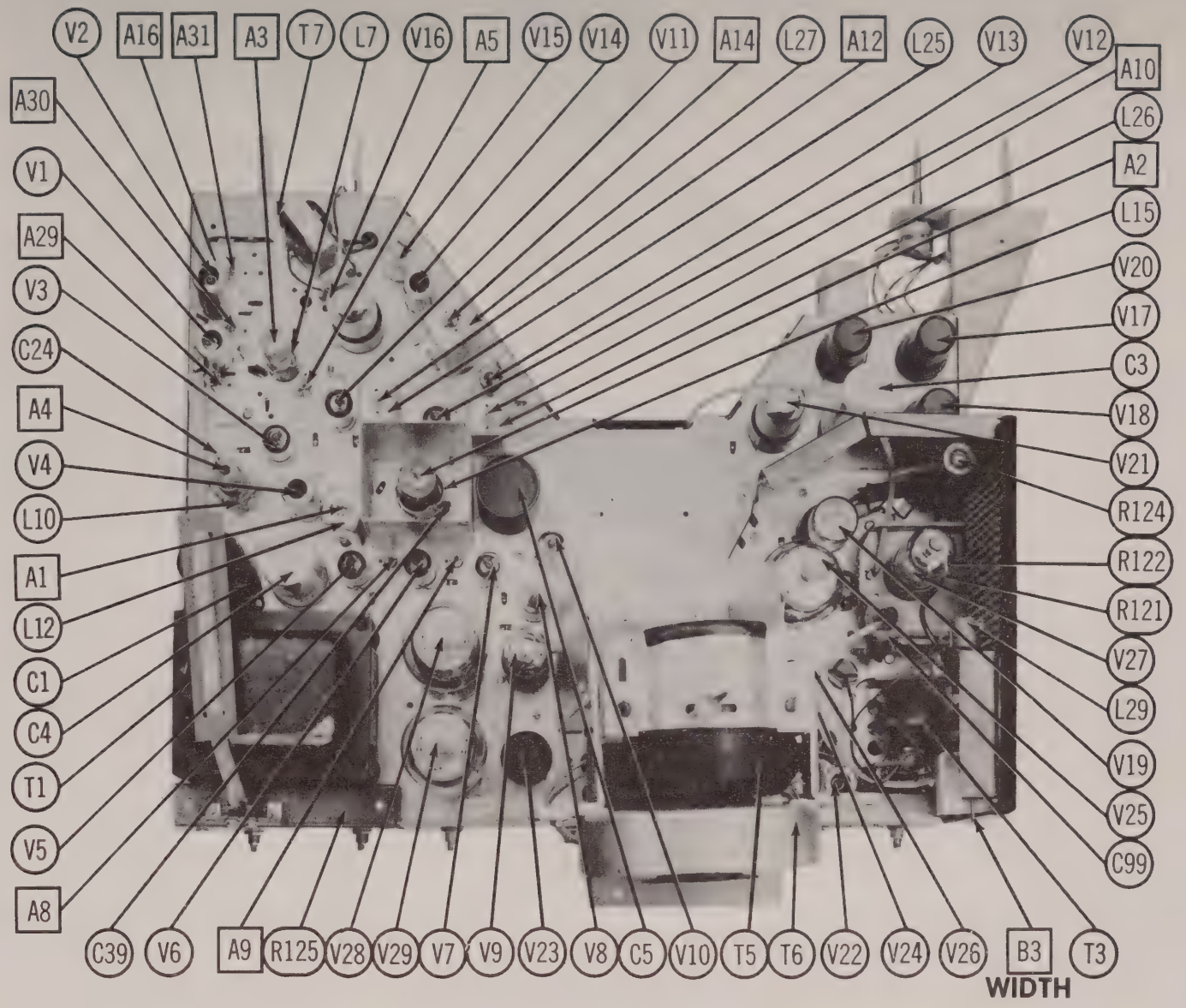
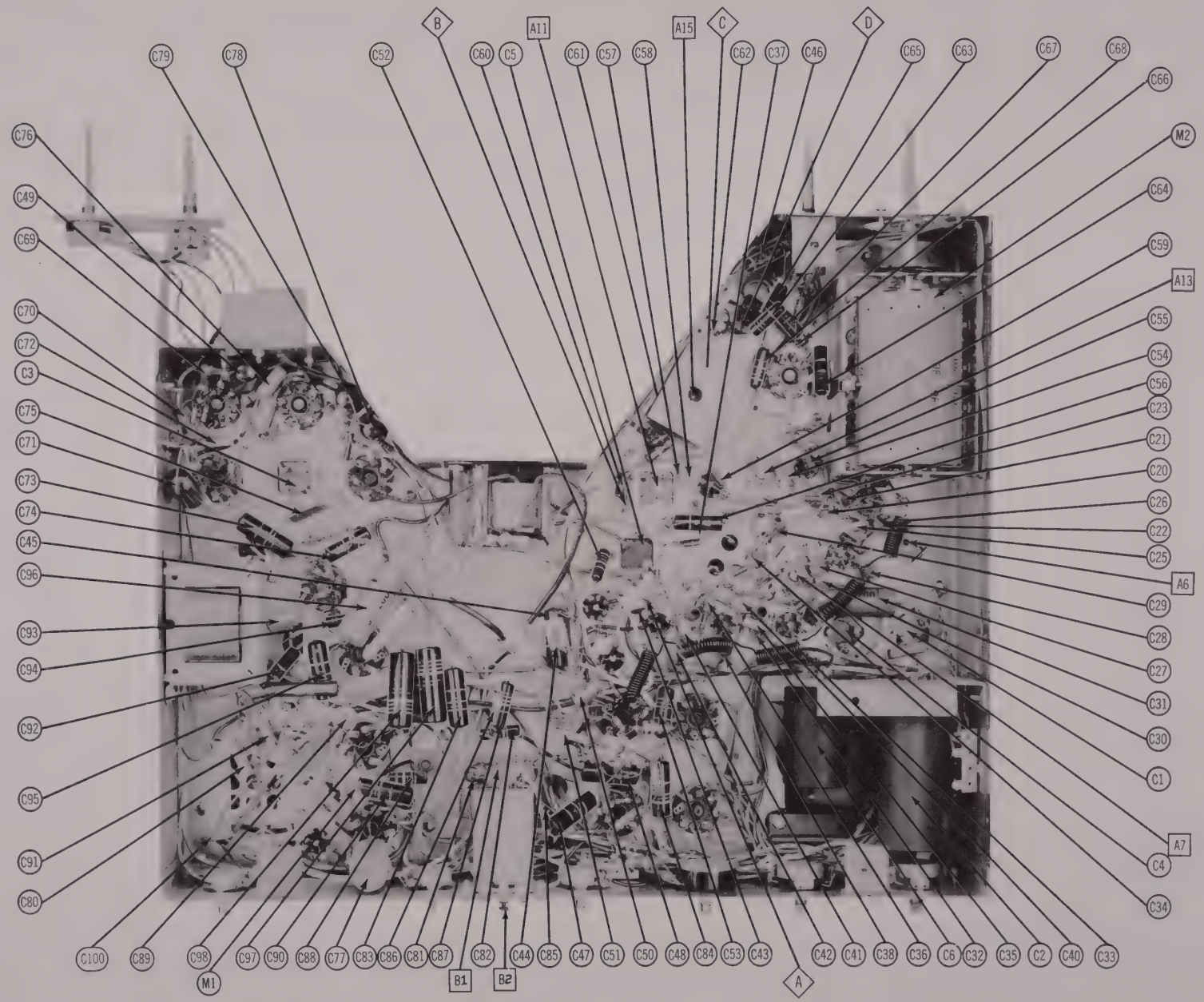
MODEL 1930



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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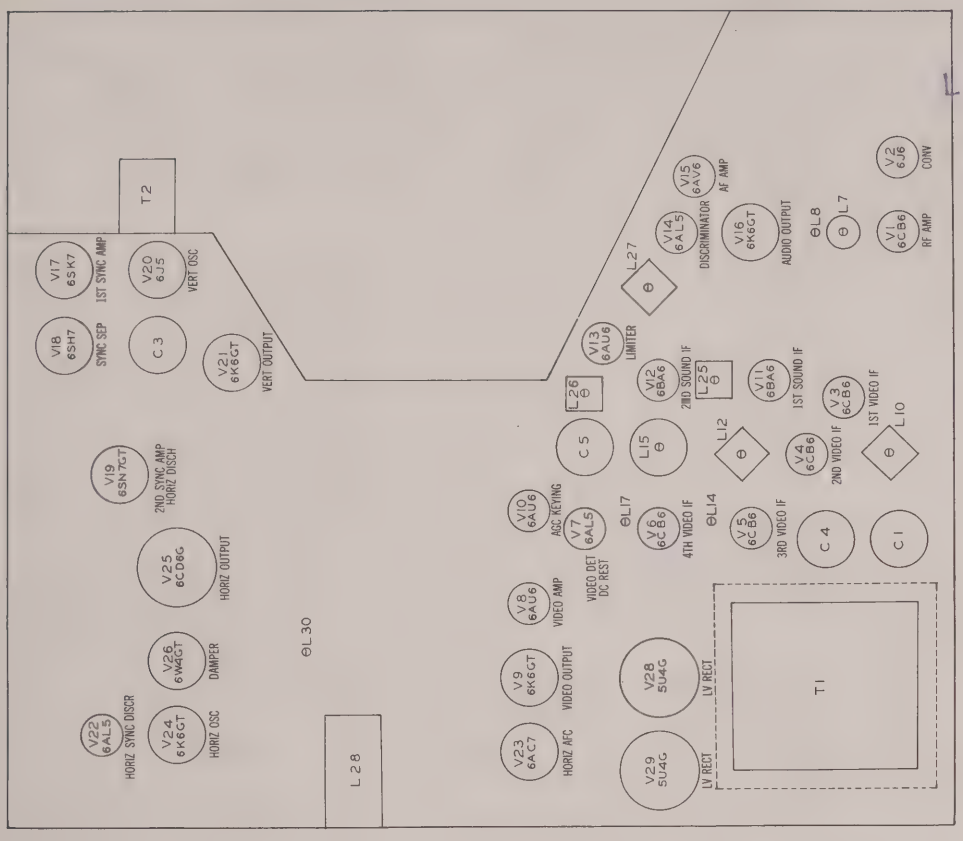
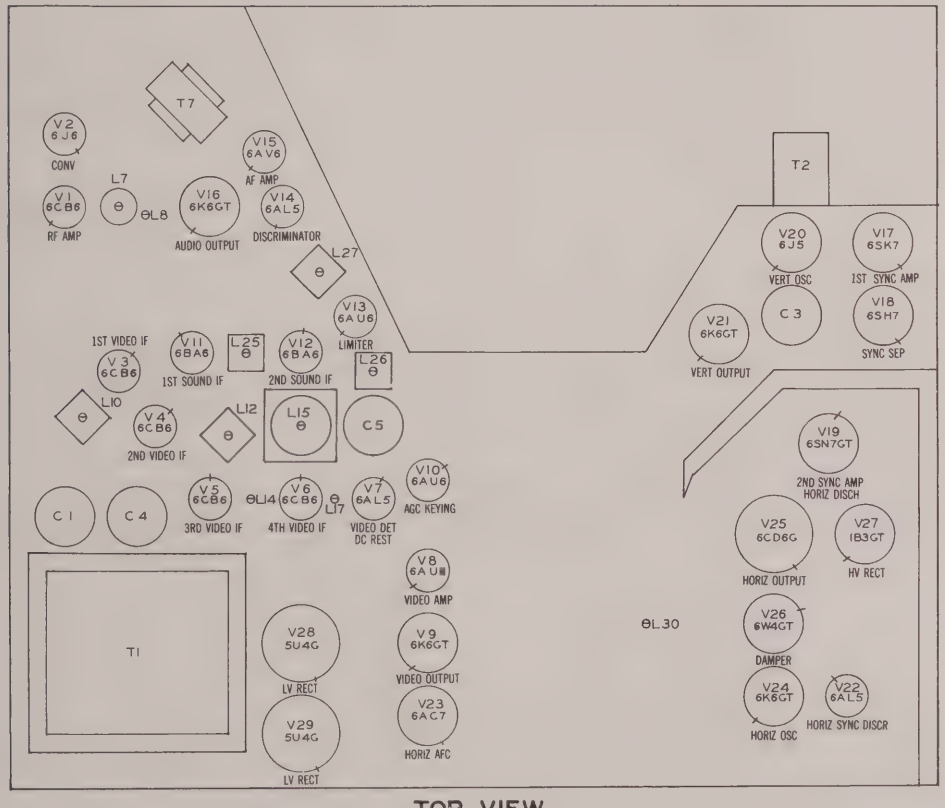
DENVER, COLORADO



BOTTOM VIEW



TOP VIEW

TUBE PLACEMENT CHART

TECH-MASTER
MODEL 1930

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal discharge tube, (V19), from its socket.

VIDEO IF ALIGNMENT

Remove the AGC tube, (V10), and the first video amp. tube, (V8) from their socket.
Remove the converter tube, (V2) from its socket and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C31, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	19.75MC (unmod.)	Any	DC probe to Point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.25MC	"	"	A2, A3	Adjust for MINIMUM deflection.
3.	"	"	27.25MC	"	"	A4	Adjust for MINIMUM deflection
4.	"	"	21.8MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	25.3MC	"	"	A6	Adjust for maximum deflection
6.	"	"	22.3MC	"	"	A7	Adjust for maximum deflection
7.	"	"	25.2MC	"	"	A8	Adjust for maximum deflection
8.	"	"	23.4MC	"	"	A9	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC swp.)	21.25MC 25.75MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A5 thru A9 for proper response. If A7 is changed repeat adjustment of trap A1.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to Pin 1, (grid) of 6BA6, (V11). Low side to chassis.	21.25MC (unmod.)	Any	DC probe to Point (B). Common to chassis.	A10, A11, A12, A13	Adjust for maximum deflection
11.	"	"	"	"	DC probe to Point (C). Common to chassis.	A14	Adjust for maximum deflection.
12.	"	"	"	"	DC probe to Point (D). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to Pin 1, (grid) of 6BA6, (V11). Low side to chassis.	21.25MC (450KC swp)	21.25MC	Any	Vert. amp. thru 33KΩ to Point (B). Low side to chassis.	A10, A11, A12, A13	Adjust for maximum amplitude and symmetry as per Fig. 2.
11.	"	"	"	"	"	Vert. amp. to Point (D). Low side to chassis.	A15, A14	Adjust A15 to 21.25MC occurs at center of crossover lines as per Fig. 3. Adjust A14 for maximum amplitude and straightness of crossover lines. Continue with step 13.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The sound IF section must be properly aligned before attempting oscillator alignment.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A16. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A16 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-posiition of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (unmod.)	13	DC probe to Point (D). Common to chassis.	A17	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
			209.75MC	12		A18	
			203.75MC	11		A19	
			197.75MC	10		A20	
			191.75MC	9		A21	
			185.75MC	8		A22	
			179.75MC	7		A23	
			87.75MC	6		A24	
			81.75MC	5		A25	
			71.75MC	4		A26	
			65.75MC	3		A27	
			59.75MC	2		A28	

ALIGNMENT INSTRUCTIONS (CONT.)

RF & MIXER ALIGNMENT

Reduce the AGC bias to 1.5 volts
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead	207MC (10MCswp)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to Point (E). Low side to chassis.	A29, A30 A31	Adjust for response curve similar to Fig. 4. with markers above 90%.
15.	"	"	213MC (10MC swp)	211.25MC 215.75MC	13	"		Check all channels for response curve cimilar to Fig. 4. If markers fall below 70% on any channel, make compromise adjustment of A29, A30 and A31 with channel switch set for that channel. Recheck all channels to see that they have not been seriously affected.

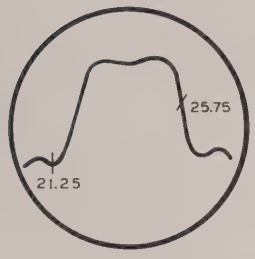


FIG. 1

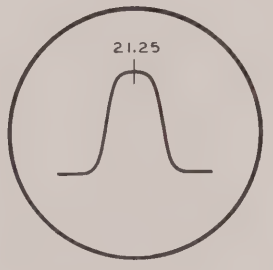


FIG. 2

FIG. 3

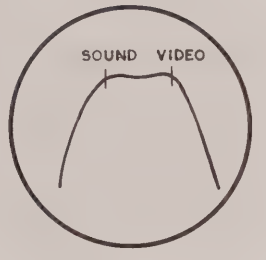


FIG. 4

RESISTANCE MEASUREMENTS

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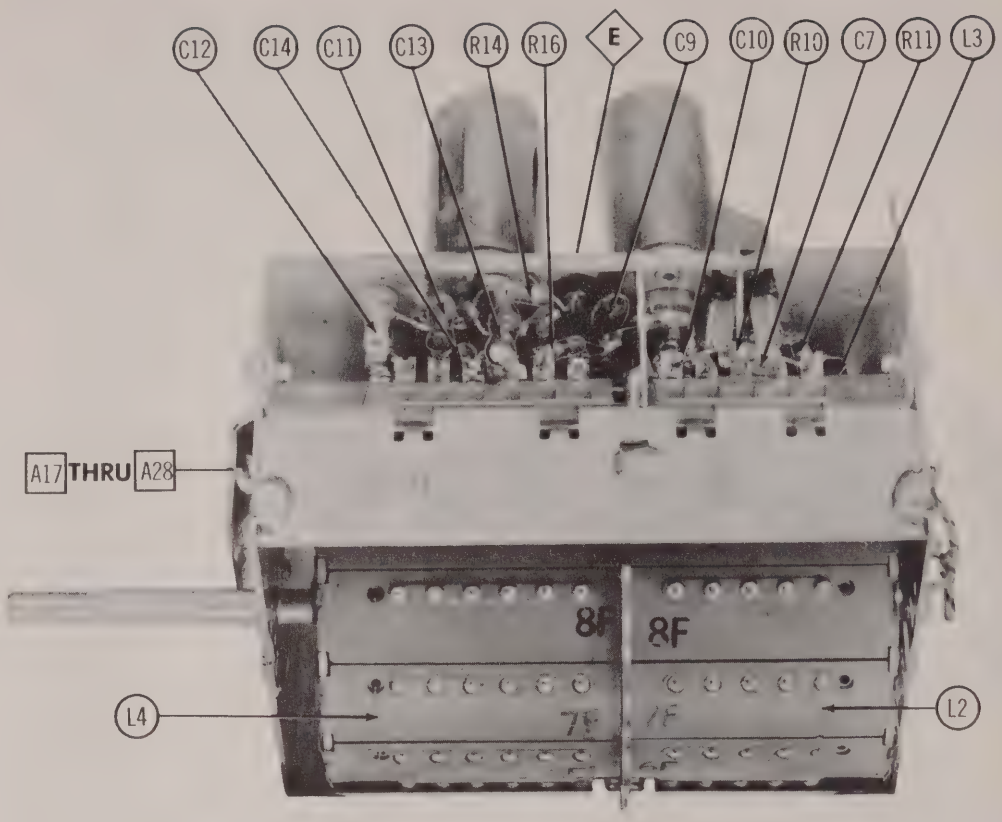
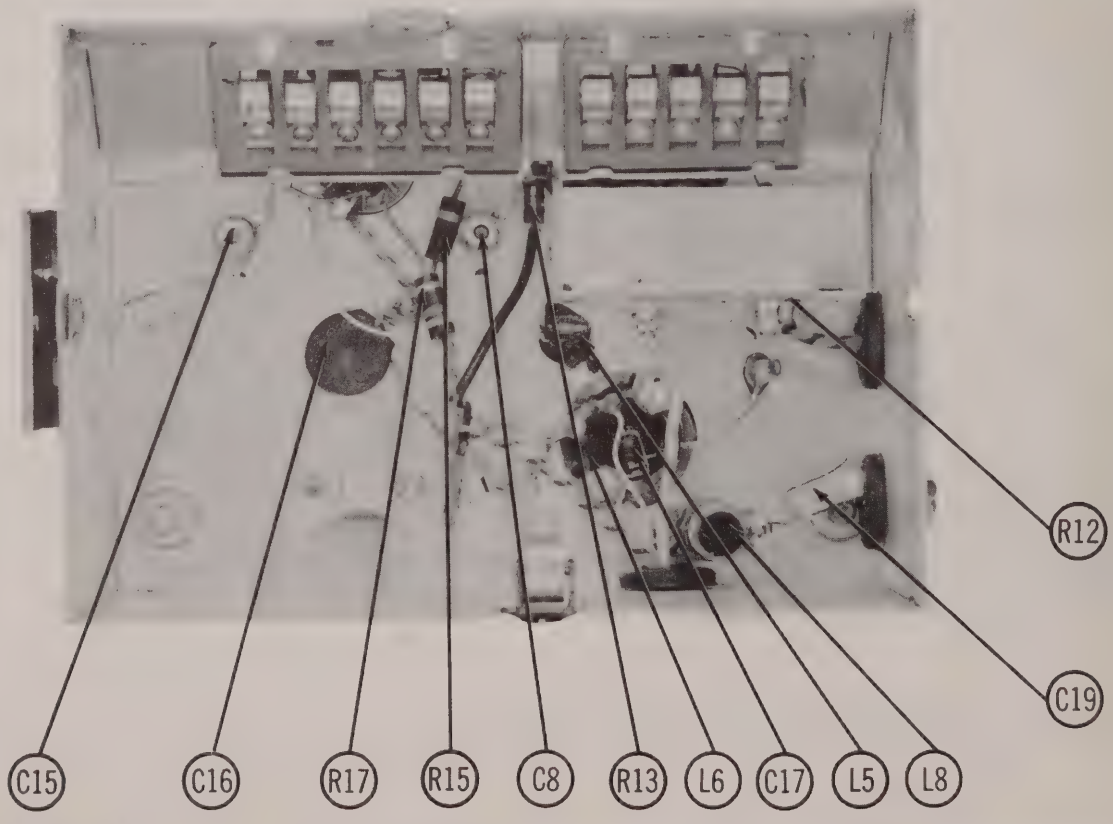
3924 MEADE ST.
DENVER, COLORADO

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	270KΩ	0Ω	.2Ω	0Ω	†4.2KΩ	†4.2KΩ	0Ω		
V 2	6J6	†6.7KΩ	†2KΩ	.2Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	260KΩ	47Ω	0Ω	.1Ω	†2.9KΩ	†2.9KΩ	0Ω		
V 4	6CB6	260KΩ	47Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 5	6CB6	255KΩ	47Ω	.1Ω	0Ω	†5.4KΩ	†2.7KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	†8KΩ	†2.4KΩ	0Ω		
V 7	6AL5	.3Ω	210KΩ	.1Ω	0Ω	1.2Meg	0Ω	3.9KΩ		
V 8	6AU6	3.9KΩ	0Ω	0Ω	.1Ω	†7.8KΩ	†1.4KΩ	0Ω		
V 9	6K6GT	0Ω	0Ω	†3.4KΩ	†1.4KΩ	510KΩ	315KΩ	.1Ω	600Ω	
V 10	6AU6	†35KΩ	†5.6KΩ	.1Ω	0Ω	315KΩ	†18KΩ	†5.6KΩ		
V 11	6BA6	0Ω	0Ω	0Ω	.1Ω	†2.4KΩ	†2.4KΩ	100Ω		
V 12	6BA6	470KΩ	0Ω	.1Ω	0Ω	†2.4KΩ	†4.7KΩ	100Ω		
V 13	6AU6	22KΩ	0Ω	0Ω	.1Ω	†5.5KΩ	†5.5KΩ	0Ω		
V 14	6AL5	200KΩ	100KΩ	1Ω	0Ω	0Ω	0Ω	100KΩ		
V 15	6AV6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†330KΩ		
V 16	6K6GT	Inf.	.1Ω	†1.5KΩ	†1KΩ	270KΩ	180KΩ	0Ω	0Ω	
V 17	6SK7	0Ω	0Ω	0Ω	1Meg	0Ω	†2.4KΩ	.1Ω	†9.4KΩ	
V 18	6SH7	0Ω	0Ω	0Ω	1Meg	0Ω	†1.4KΩ	.1Ω	†8.2KΩ	
V 19	6SN7GT	1Meg	†7.1KΩ	0Ω	■220KΩ	†680KΩ	■0Ω	.1Ω	0Ω	
V 20	6J5	0Ω	0Ω	#1Meg	■60KΩ	■2Meg	■500KΩ	.1Ω	■0Ω	
V 21	6K6GT	Inf.	.1Ω	†1.8KΩ	†1.8KΩ	■2.2Meg	■1.8KΩ	0Ω	■3.7KΩ	
V 22	6AL5	940KΩ	1.5Meg	0Ω	1Ω	12Ω	0Ω	1.5Meg		
V 23	6AC7	0Ω	0Ω	0Ω	1.4Meg	10Ω	18KΩ	.1Ω	†20KΩ	
V 24	6K6GT	600Ω	0Ω	†5KΩ	†10KΩ	70KΩ	#28Ω	.1Ω	10Ω	
V 25	6CD6G	Inf.	.1Ω	■280Ω	■330KΩ	■330KΩ	Inf.	0Ω	†25KΩ	TOP CAP #68Ω
V 26	6W4GT	#28Ω	†75Ω	3.5Meg	Inf.	†75Ω	Inf.	#.1Ω	#0Ω	
V 27	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP #408Ω
V 28	5U4G	Inf.	5.3KΩ	■0Ω	■15Ω	Inf.	■15Ω	Inf.	5.3KΩ	
V 29	5U4G	Inf.	5.3KΩ	Inf.	■15Ω	†60Ω	■15Ω	†70Ω	5.3KΩ	
V 30	16JP4	0Ω	1.3Meg	PIN 10 †150KΩ	PIN 11 0Ω	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 8 OF V28 & V29
# MEASURED FROM PIN 3 OF V26
■ MEASURED FROM -95 VDC LINE



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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3624 WEST
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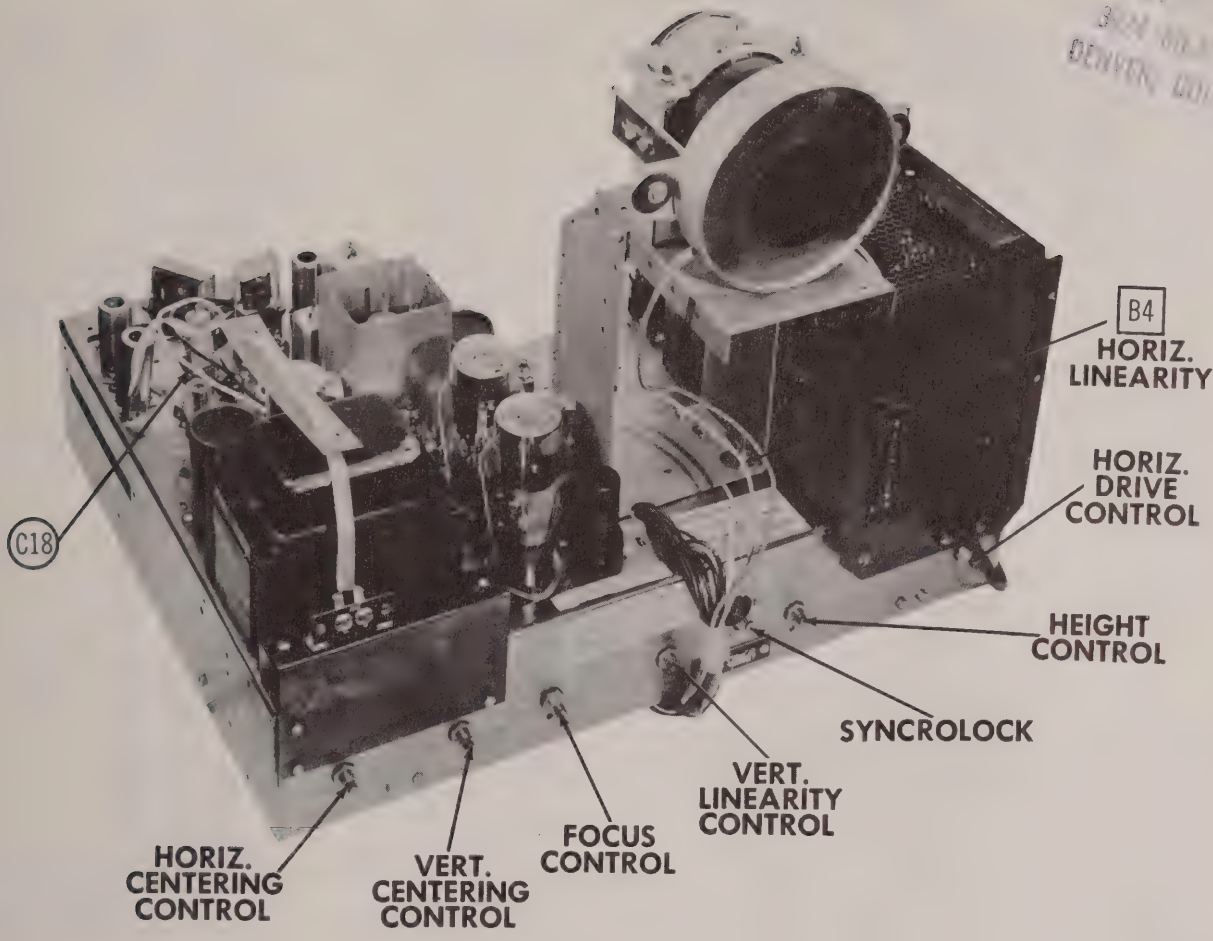


CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT CHECK.
While receiving a television signal turn the horizontal hold control fully counter-clockwise. Remove the picture momentarily by turning the contrast control fully counter-clockwise and then return it to its normal operating position. The picture should pull back into synchronization.
Now turn the horizontal hold control fully clockwise. Remove the picture momentarily by turning the contrast control fully counter-clockwise and then return to its normal operating position. The picture should pull back into synchronization.
If receiver synchronizes properly under these checks it is not necessary to align the horizontal oscillator. However, if the picture is not normal or stable, the horizontal oscillator must be aligned.

SLIGHT RETOUCH ALIGNMENT
If the receiver failed in the above check at either extreme of the hold control, it may be possible to align the horizontal oscillator by making slight adjustments.
Tune in a TV station and adjust fine tuning for best sound quality. Adjust vertical hold control to vertically synchronize the picture. Adjust the contrast control to slightly less than normal. Turn the horizontal hold control to the extreme position in which the oscillator falls out of synchronization. Momentarily remove the signal. Adjust B2 (rear of chassis) until the oscillator pulls into synchronization. Check hold and pull-in as outlined above.

COMPLETE ALIGNMENT
Tune in a TV station for the best sound quality. Adjust vertical hold control to vertically synchronize the picture. Adjust the contrast control to slightly less than normal.
Adjust B1 until the blanking bar, which may appear in the picture, moves to the right and off the raster. If ripples occur in the raster turn B1 in a clockwise direction until the unstable condition is removed. The length of this adjustment screw in its correct position is usually about $\frac{1}{2}$ inch beyond the bushing.
Turn horizontal hold control fully counter-clockwise and adjust B2 clockwise until picture fails to synchronize. Now slowly turn B2 counter-clockwise to the point where the picture synchronizes. Readjust B1 so that the left side of the picture is close to the left side of the raster but does not fold over.
Turn the horizontal hold control fully clockwise. The right side of the picture should be close to the right side of the raster, but should not fold over. If it does, readjust B1.
Momentarily remove the signal. When signal is restored, the picture should fall into synchronization. If it does not, turn B2 counter-clockwise until picture falls into synchronization.
Turn horizontal hold control fully counter-clockwise. Picture should fall back into synchronization after momentary removal of the signal.
If the picture fails to synchronize after momentary removal of the signal at both extremes of the horizontal hold control, there may be insufficient pull-in range. However, if picture will pull in through 3/4 of the hold control range, operation should be satisfactory as excessive pull-in is objectionable. Excessive pull-in makes the control circuits more sensitive which may result in their being triggered by noise pulses. Also the vertical synchronizing and equalizing pulses may cause a bend in the upper part of the picture.

HORIZONTAL LINEARITY ADJUSTMENTS
Turn the horizontal drive control clockwise as far as possible without crowding the right half of the picture. Adjust the width slug, (B3) until the picture is slightly wider than necessary to fill the mask horizontally. Adjust the horizontal linearity slug, (B4) until the picture is symmetrical from left to right.
Since both width and horizontal linearity are effected by the drive control, it may be necessary to readjust it to obtain optimum linearity with proper width.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TECH-MASTER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6CB6	6CB6	7CM	
V2	Converter	6J6	6J6	7Br	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Det.-DC Restorer		6AL5	6BT	
V8	Video Amp.		6AU6	7BK	
V9	Video Output		6K6GT	7S	
V10	Keyed AGC		6AU6	7BK	
V11	1st Sound IF Amp.		6BA6	7BK	
V12	2nd. Sound IF Amp.		6BA6	7BK	
V13	Limiter		6AU6	7BK	
V14	Discriminater		6AL5	6BT	
V15	Audio Amp.		6AV6	7BT	
V16	Audio Output		6K6GT	7S	
V17	1st. Sync. Amp.		6SK7	8N	
V18	Sync. Sep.		6SH7	8BK	
V19	2nd. Sync. Amp.-Horiz. Discharge.		6SN7GT	8BD	
V20	Vert. Osc.		6J5	6Q	
V21	Vert. Output		6K6GT	7S	
V22	Horiz. Sync. Discr.		6AL5	6BT	
V23	Horiz. AFC		6AC7	8N	
V24	Horiz. Osc.		6K6GT	7S	
V25	Horiz. Output		6CD6G	5BT	
V26	Damper		6W4	4CG	
V27	HV Rect.		1B3GT	3C	
V28	LV Rect.		5U4G	5T	
V29	LV Rect.		5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: TECH. MASTER PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: THOMAS PART No.	RTMA BASE TYPE	NOTES
V30	12" to 20"			12D	Replace with original type

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TECH-MASTER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH2-64		UP8445		TVL-3761	▲ Filter
B	80	150							▲ Bias Filter
C2A	40	450		AFH3-43		UPT44145		TVL-3785	▲ Filter
B	40	450							■ Filter
C	10	450							▲ Vert. Output Dec.
C3A	10	475		AFH4-114				TVL-4829	▲ Filter †
B	5	475							■ Filter †
C	80	450							▲ Filter †
D	40	50							Vert. Output Cathode ¶
C4A	30	450						TVL-2730	▲ Decoupling †
B	30	450							■ Decoupling †
C	20	450							▲ Decoupling †
D	20	450							Audio Output Dec.
C5A	40	350		AFH2-86		UP4245		TVL-2735	▲ Decoupling
B	10	200							▲ Decoupling
C6A	250	10		AFH2-74	UP1M-15			TVL-2140	▲ Horiz. Cent. Cont. Bypass
B	1000	6			BRH1225A				▲ Vert. Cent. Cont. Bypass
C7	3-9				829-10				Variable Trimmer
C8	.5-3				829-3				Variable Trimmer
C9	120			SI120	D6-121		GP2K-121	5GA-T12	RF Amp. Dec.
C10	1000			SI1000	D6-102		GP2L-102	5HK-D1	RF Amp. Fil.
C11	100			HH156	D6-101		GP1K-101	5GA-T1	RF Coupling
C12	.5-3				829-3				Variable Trimmer
C13	20			SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C14	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C15	.5-3				829-3				Variable Trimmer
C16A	1000			BPD-2X001	DD-2-102		812-001	5HK-2D1	Conv. Fil.
B	1000								RF Bypass
C17	10			SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C18	68	500		1469-00007		5R5Q7		MS-47	Fixed Trimmer
C19	120			SI120	D6-121		GP2K-121	5GA-T12	Video IF Coupling
C20	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter
C21	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st Video IF Dec.
C22	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st Video IF Fil.
C23	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass
C24	43								Fixed Trimmer
C25	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Video IF Coupling
C26	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter
C27	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	2nd Video IF Dec.
C28	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	2nd Video IF Dec.
C29	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass
C30	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Video IF Coupling
C31	.5	200		P288-5		GT2P5		2TM-P5	AGC Filter
C32	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	3rd. Video IF Dec.
C33	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	3rd. Video IF Fil.
C34	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass
C35	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Video IF Coupling
C36	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	4th. Video IF Screen
C37	82	500		SI82			GP1K-820		4th. Video IF Cathode
C38	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	4th. Video IF Fil.
C39	75	500		1469-000075					Fixed Trimmer
C40	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass
C41	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Video IF Coupling
C42	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	Video Det. Fil.
C43	10			SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Video Det. Filter
C44	470	500		1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	V ideo Coupling
C45	.05	600		P688-05	DF-503	PTE685		6TM-S5	Video Coupling
C46	.0047	600		P688-0047	D6-472	PTE6D5		6TM-D47	Video Amp. Cathode
C47	.05	600		P688-05	DF-503	PTE685		6TM-S5	Video Coupling
C48	.05	600		P688-05	DF-503			6TM-S5	Video Coupling
C49	.25	400		P488-25		GT4P25		4TM-P25	Bias Filter
C50	1000	500		1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Feedback

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Tech-Master PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C51	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Voltage Divider
C52	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Keyed AGC Cathode
C53	.05	400		P488-05	DF-503	PTE485		4TM-S5	AGC Filter
C54	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st.Sound IF Dec.
C55	1500			BPD-0015	DD-152	1W5D15	801-0015		1st.Sound IF Cathode
C56	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	2nd.Sound IF Grid
C57	1500			BPD-0015	DD-153	1W5D15	801-0015	5HK-D15	2nd. Sound IF Plate
C58	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	2nd. Sound IF Screen
C59	1500			BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	2nd. Sound IF Cathode
C60	51			SI51			GP1K-510		Limiter Grid
C61	5000			BPD-005	DD-502	1D5D5	81L-005	5HK-D5	Limiter Det.
C62	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Diode Load Cap.
C63	.0025	600		P688-0022	D6-252	PTE6D2	GP2-333-252	6TM-D22	Audio Coupling
C64	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Tone Comp.
C65	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C66	.0025	600		P688-0022	D6-252	PTE6D2	GP2-333-252	6TM-D22	AF Amp. Plate
C67	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C68	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C69	.05	600		P688-05	DF-503	PTE685		6TM-S5	Sync. Coupling
C70	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Voltage Divider
C71	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	RF Bypass
C72	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Sync. Coupling
C73	.05	600		P688-05	DF-503	PTE685		6TM-S5	Sync. Coupling
C74	.01	600		P688-01	D6-103	PTE6S1		6TM-S1	Vert. Sync. Coupling
C75A	.002			P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Vert. Integrator Net.
B	.005			P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Integrator Net.
C	.005			P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Osc. Grid Cap.
C76	4700	500		1464-005		1DR5D5		MS-25	Vert. Osc. Dec.
C77	.25	600		684-25		GP6P25		6TM-P25	Vert. Discharge
C78	.05	600		P688-05	DF-503	PTE685		6TM-S5	Vert. Sweep Coupling
C79	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sync. Coupling
C80	82	500		SI82			GP1K-820		Horiz. Fixed Trimmer
C81	.015	600		P688-015		PTE6S15		6TM-S15	AFC Filter
C82	.004	600		P688-004	D6-402	PTE6D4	GP2-333-402	6TM-D4	AFC Filter
C83	.05	600		P688-05	DF-503	PTE685		6TM-S5	AFC Screen Bypass
C84	.05	600		P688-05	DF-503	PTE685		6TM-S5	AFC Coupling
C85	.004	600		P688-004	D6-402	PTE6D4	GP2-333-402	6TM-D4	AFC Filter
C86	1200			SI1200	D6-122	1R5D15	GP2L-122		AFC Filter
C87	.015	600		P688-015		PTE6S15		6TM-S15	Horiz. Sync. Coupling
C88	.004	600		P688-004	D6-402	PTE6D4	GP2-333-402	6TM-D4	Horiz. Bold Bypass *
C89	1500			B PD-0015	DD-152	1W5D15	801-0015	5HK-D15	Horiz. Osc. Screen
C90	.05	600		P688-05	DF-503	PTE685		6TM-S5	Horiz. Sweep Coupling
C91	390	500		1468-0004	D6-390	5W5T4	GP2K-391	1FM-34	Horiz. Sweep Coupling
C92	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Horiz. Sweep Coupling
C93	680	500		1479-0007		1R5T7		MS-37	Horiz. Sweep Coupling
C94	.001	1000		P1088-001		PTE1S1D1		MB-D1	Horiz. Output Screen
C95	.05	600		P688-05	DF-503	PTE685		6TM-S5	Horiz. Output Cathode
C96	.5	200		P288-5		GT2P5		2TM-P5	Damper Filter
C97	.05	1000		P1088-05		GT16S5		MB-S5	Dampler Filter
C98	.05	1000		P1088-05		GT16S5		MB-S5	HV Filter
C99	500	20000		HV20C	TV3-502	MM-C20-5			Line Filter
C100A	10000			BPD-01	DD-3-103	1D3S1	821-01	5HK-81	Line Filter
B	10000			BPD-01		1D3S1	821-01	5HK-81	Line Filter

* Not used in all models.
† Some models use 80MFD only in lieu of C3A, C3B, C3C.
‡ Some models use 80MFD only in lieu of C4A, C4B, C4C.
¶ Some models use 50MFD in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Tech-Master PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	100Ω	1		Concentrikit			
B	1Meg	1		B17-116 *	RTV-1	SBBT-504-S	Contrast Control-Panel
C	Shaft End			B13-137X *			Volume Control- Tapped @ 150K-Rear
D	Switch			E-187 *			Attach per instructions in "Concentrikit"
				76-1 *			Attach per instructions in "Concentrikit"
				Concentrikit			
R2A	1Meg	1		B11-137 *	RTV-65	SBB-505	Vert. Hold Control- Panel
B	50KΩ	1		B11-123 *			Horiz. Hold Control- Rear
C	Shaft End			E-187 *			Attach per instructions in "Concentrikit"
R3A	50KΩ	1		Q11-123	AG-44-8	B-31	Brightness Control
B	Shaft			Not Req.	FS-3	Not Req.	Attach to R3A per instructions
R4A	20KΩ	1		Q11-120	AG-40-8	AN-22	Horiz. Drive Control
B	Shaft			Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	2.5Meg	1		Q11-239	AG-84-8	AN-83	Height Control
B	Shaft			Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	5000Ω	1		Q11-114	AG-19-8	AN-10	Vert. Linearity Control
B	Shaft			Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7	1500Ω	3		S6-2000	S6-2000	VK-130	Focus Control- Wire Wound
R8	20Ω	2		W20X10	RTV-98	SVT-901	Vert. Centering Control- Tapped @ 10Ω Wire Wound
R9	20Ω	2		W20	43-20	VK-110	Horiz. Centering Control- Wire Wound

* Additional Parts to be used with Concentrikit

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TECH. MASTER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 20% UNLESS OTHERWISE STATED
R10	3900Ω 10%	1		BTS-3900	Antenna coil shunt
R11	47KΩ 10%	1		BTS-47K	AGC Network
R12	10KΩ 10%	1		BTS-10K	RF Plate Coil Shunt
R13	2200Ω 10%	1		BTS-2200	RF Decoupling
R14	4700Ω 10%	1		BTS-4700	Mixer Grid
R15	220KΩ 10%	1		BTS-220K	Mixer Grid
R16	10KΩ 10%	1		BTS-10K	Osc. Grid
R17	4700Ω 10%	1		BTS-4700	Osc. Plate
R18	10KΩ	1			1st. Video IF Grid
R19	47Ω	1			1st. Video IF Cathode
R20	1000Ω 10%	1		BTS-1000	1st. Video IF Decoupling
R21	150Ω	1		BTS-150	Decoupling
R22	150Ω	1		BTS-150	Decoupling
R23	1000Ω 10%	1		BTS-1000	AGC Network
R24	1000Ω 10%	1		BTS-1000	AGC Network
R25	10KΩ	1			2nd. Video IF Grid

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Tech-Master PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R26	47Ω	1			2nd. Video IF Cathode
R27	1000Ω 10%	1		BTS-1000	2nd. Video IF Decoupling
R28	150Ω	1		BTS-150	Decoupling
R29	4700Ω	1		BTS-4700	3rd.Video IF Grid
R30	47Ω	1			3rd. Video IF Cathode
R31	2700Ω	½		BTS-2700	3rd. Video IF Plate
R32	1000Ω 10%	1		BTS-1000	3rd. Video IF Decoupling
R33	150Ω	1		BTS-150	Decoupling
R34	180Ω	1		BTS-180	4th. Video IF Cathode
R35	5800Ω	1			4th. Video IF Plate
R36	1000Ω	1		BTS-1000	4th. Video IF Decoupling
R37	3900Ω 5%	1		BTS-3900-5%	Video Detector Diode Load
R38	27KΩ	1		BTS-27KΩ	AGC Keying Grid
R39	47KΩ 10%	1		BTS-47K	AGC Keying Cathode
R40	18KΩ 10%	1		BTS-18K	AGC Keying Screen
R41	5800Ω	1		BTS-5800	Voltage Divider
R42	6800Ω	1		BTS-6800	Feedback
R43	18KΩ 10%	1		BTS-18K	AGC Network
R44	47KΩ 10%	1		BTS-47K	AGC Network
R45	220KΩ 10%	1		BTS-220K	AGC Network
R46	27KΩ	1		BTS-27K	Video Amp Plate
R47	5800Ω	1		BTS-5800	Video Amp Plate
R48	3300Ω	1		BTS-3300	Video Amp Plate
R49	820Ω	1		BTS-820	Video Output Grid
R50	1.2Meg	½		BTS-1.2Meg	Bias Network
R51	12KΩ	2		BTB-12K	Bias Network
R52	100Ω 10%	½		BTS-100	Video Output Cathode
R53	3300Ω	1		BTA-3300	Video Output Plate
R54	10KΩ	1		BTS-10K	Isolation
R55	100KΩ	1		BTS-100K	Picture Tube Grid
R56	1Meg	1		BTS-1Meg	DC Restorer Diode Load
R57	47KΩ 10%	1		BTS-47K	Bias Network
R58	150KΩ	1		BTS-150K	Bias Network
R59	150KΩ	1		BTS-150K	AGC Anode Load
R60	100Ω 10%	1		BTS-100	1st Sound IF Cathode
R61	1000Ω 10%	1		BTS-1000	1st Sound IF Decoupling
R62	470KΩ 10%	1		BTS-470K	2nd Sound IF Grid
R63	100Ω 10%	1		BTS-100	2nd Sound IF Cat hode
R64	3300Ω 10%	1		BTS-3300	2nd Sound IF Screen
R65	1000Ω	1		BTS-1000	2nd Sound IF Plate Decoupling
R66	22KΩ	1			Limiter Grid
R67	10KΩ	1			Limiter Decoupling
R68	10KΩ	1			Voltage Divider
R69	2.2Ω	1		BW-1-2.2	Filament Dropping (Wire Wound)
R70	100KΩ	1		BTS-100K	Discriminator Diode Load
R71	100KΩ	1		BTS-100K	Discriminator Diode Load
R72	22KΩ	1		BTS-22K	De-emphasis
R73	27KΩ	1		BTS-27K	Tone Compensation
R74	10Meg 10%	1		BTS-10Meg	AF Amp. Grid
R75	330KΩ 10%	1		BTA-330K	AF Amp. Plate
R76	270KΩ 10%	1		BTS-270K	Output Grid
R77	1000Ω	2		BTB-1000	Output Decoupling
R78	6.8Meg	1		BTS-6.8Meg	Bias Network
R79	1Meg	1		BTS-1Meg	1st Sync. Amp. Grid
R80	4700Ω	1		BTA-4700	1st Sync. Amp. Plate Decoupling
R81	4700Ω 10%	1		BTA-4700	1st Sync. Amp. Plate
R82	4.7Meg	1		BTS-4.7Meg	Bias Network
R83	1Meg	1		BTS-1Meg	Sync. Seperator Grid
R84	6800Ω	1		BTS-6800	Sync. Seperator Plate
R85	1Meg	1		BTS-1Meg	2nd Sync. Amp. Grid
R86	4700Ω	1		BTS-4700	2nd Sync. Amp. Plate
R87	1000Ω	1		BTS-1000	Decoupling
R88	22KΩ	1		BTS-22K	Voltage Divider
R89	22KΩ	1		BTS-22K	Integrator Network
R90	8200Ω	1		BTS-8200	Integrator Network
R91	8200Ω	1		BTS-8200	Integrator Network
R92	1.5Meg 5%	1		BTS-1.5Meg 5%	Vert. Osc. Grid
R93	2.2Meg 10%	1		BTS-2.2Meg	Vert. Output Grid
R94	220KΩ	1		BTS-220K	Vert. Osc. Plate
R95	100K	1		BTS-100K	Voltage Divider
R96	2.2Meg	1		BTS-2.2Meg	Voltage Divider
R97	8200Ω 10%	1		BTS-8200	Vert. Peaking
R98	1800Ω 10%	1		BTS-1800	Vert. Output Cathode
R99	1000Ω	1		BTA-1000	Vert. Output Decoupling
R100	470KΩ 10%	1		BTS-470K	Horiz. Sync. Discriminator Load
R101	1Meg	1		BTS-1Meg	Horiz. Sync. Discriminator Load
R102	470KΩ 10%	1		BTS-470K	Horiz. Sync. Discriminator Load
R103	470KΩ 10%	1		BTS-470K	AFC Filter Network
R104	560Ω 10%	1		BTS-560	AFC Control Grid
R105	10Ω 5%	1			AFC Control Cathode
R106	47KΩ	1		BTA-47K	AFC Control Plate
R107	39KΩ	1		BTS-39K	AFC Control Plate
R108	39KΩ	1		BTS-39K	AFC Control Screen
R109	27KΩ 10%	1		BTS-27K	Voltage Divider
R110	27KΩ 10%	1		BTS-27K	Horiz. Osc. Grid
R111	10KΩ	1		BTA-10K	Horiz. Osc. Screen
R112	5000Ω	5		1 3/4-5000	Horiz. Osc. Plate (Wire-Wound)
R113	6800Ω	1		BTS-6800	Differentiator
R114	220KΩ 10%	1		BTS-220K	Horiz. Discharge Grid
R115	680KΩ 10%	1		BTS-680K	Horiz. Discharge Plate See Note 1.
R116	6800Ω	1		BTS-6800	Horiz. Peaking See Note 3.
R117	330KΩ 10%	1		BTA-330K	Horiz. Output Grid
R118	100Ω 10%	½			Parasitic Suppressor
R119	280Ω	4			Horiz. Output Cathode (Wire-Wound)
R120	25KΩ	4		1 3/4A-25000	Horiz. Output Screen (Wire-Wound)
R121	3.3Ω	½			High Voltage Rectifier Filament (Wire-Wound)
R122	470KΩ	½			High Voltage Filter See Note 2.
R123	270Ω 10%	2		BW-2-270	Focus Coil Shunt Wire Wound
R124A	1360Ω	17			Filter Wire Wound
B	230Ω	10			Bias Network
R125A	6750Ω	5			Bleeder
B	93Ω	4			Bias Network
C	12Ω	1			Bias Network
R126	10Ω	½			Horiz. Centering Network Wire-Wound
R127	56KΩ 20%	½		BTS-56K	Filter

Note 1. Some models use 560KΩ resistor in this application.
Note 2. Some models use 1 Meg resistor in this application.
Note 3. Some models use 4700Ω resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	TECH-MASTER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1A	117VAC @2.7A	680VCT .330ADC	5VAC @6.0A	12.6VCT @6.1A SEC:4 6.3VAC @1.2A	TP-147A		P-3067	
T1B					TP-157 ①			

① Alternate Transformer used in some Models

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA TECH MASTER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	175Ω	1400Ω	8T2	A-8122	A-4003	TBO-2	Vert. Oscillator Trans.
T3	375Ω Tapped @40Ω	24Ω Tapped @ 12Ω & 17Ω SEC. 2 0Ω	TJ1	A-8130	HVO-7		Horiz. Output Trans.
T4	760Ω	8Ω	4T2	A-8112 ②	A-3036	TS0-1	Vert. Output Trans.
T5A	15Ω		LD2	DY-7 ③	MD-12 ③		Horiz. Deflection Coils
B	61Ω			DY-8 ④	MDF-70 ④		Vert. Deflection Coils
T6	470Ω		2D2	FC-11	MF-2		

② Drill One New Mounting Hole
③ For Tubes having 50 deg. to 60 deg. deflection ④ For tubes having 60 Deg. to 70 Deg. deflection

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA TECH. MASTER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	5KΩ	3.4Ω	480Ω	.7Ω	T-114	A-3877	A-2930	RO-8	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA TECH MASTER PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	PM	3.6Ω		57J9	57A1	
	CONE DIA.	V. C. DIA.				
SP1B	5" x 7"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ↶)	REPLACEMENT DATA TECH MASTER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.300ADC	60Ω	2 Henries	CH1	A-2326	C-2991	TR-3300 ②	② Drill One New Mounting Hole.

COILS (RF-IF)

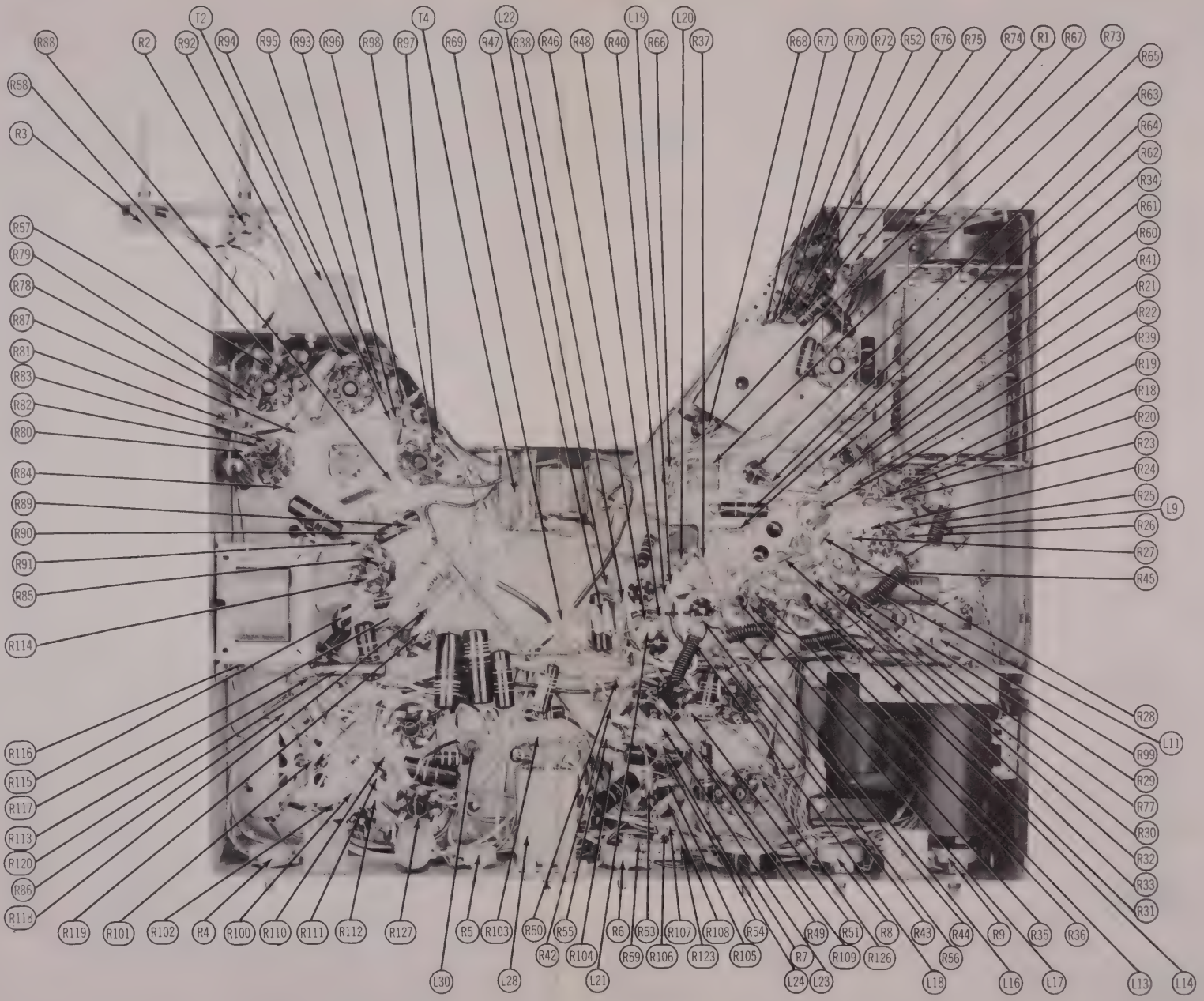
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Tech-Master PART No.	MERIT PART No.	NOTES
L2	Ant. Coils	0Ω	0Ω			
L3	Fil. Choke	0Ω				
L4	RF Mixer Grid and Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	RF Choke	0Ω				
L7	Sound Take Off	0Ω				
L8	1st Video IF	1.2Ω				
L9	Fil. Choke	0Ω		204L1		
L10	2nd Video IF	.1Ω		202K7		Includes Trap
L11	Fil. Choke	0Ω		204L1		
L12	3rd Video IF	.1Ω		202K3		Includes Trap
L13	Fil. Choke	0Ω		204L1		
L14	4th Video IF	.2Ω		202L1		
L15	Sound Trap	.1Ω		202K4		
L16	Fil. Choke	0Ω		204L1		
L17	5th Video IF	.2Ω		202L1		
L18	Fil. Choke	0Ω		204L1		
L19	Peaking Coil	4.8Ω		203L3		120Microhenries, Blue Dot Wound on 22KΩ resistor.
L20	Peaking Coil	7.4Ω		203L2		250Microhenries, Green Dot
L21	Peaking Coil	4.8Ω		203L3		120Microhenries, Blue Dot, Wound on 22KΩ resistor.
L22	Peaking Coil	4.2Ω		203L4		93Microhenries, Red Dot
L23	Peaking Coil	4.8Ω		203L3		120Microhenries, Blue Dot, Wound on 22KΩ resistor.
L24	Peaking Coil	4.2Ω		203L4		93 Microhenries, Red Dot
L25	1st Sound IF	.1Ω	.1Ω	201K1		
L26	2nd Sound IF	.1Ω	.1Ω	201K1		
L27	Discr. Trans.	.1Ω	.1Ω	203K1		
L28	Horiz. Osc.	44Ω	37Ω	8T8		Pri. Tap @ 22Ω Sec. Tap @ 28Ω
L29	Width Coil	28Ω	86Ω	L1R4-E	MWC-1	
L30	Horiz. Lin.	28Ω		L1R4-J	MWC-1	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Tech-Master PART No. FUSE	Tech-Master PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	REMARKS
M1	3AG	1/4A			318.250		

MISCELLANEOUS

ITEM No.	PART NAME	Tech-Master PART No.	NOTES
M2A	RF Tuner	TV201	
M3	Ion Trap	1T1	



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
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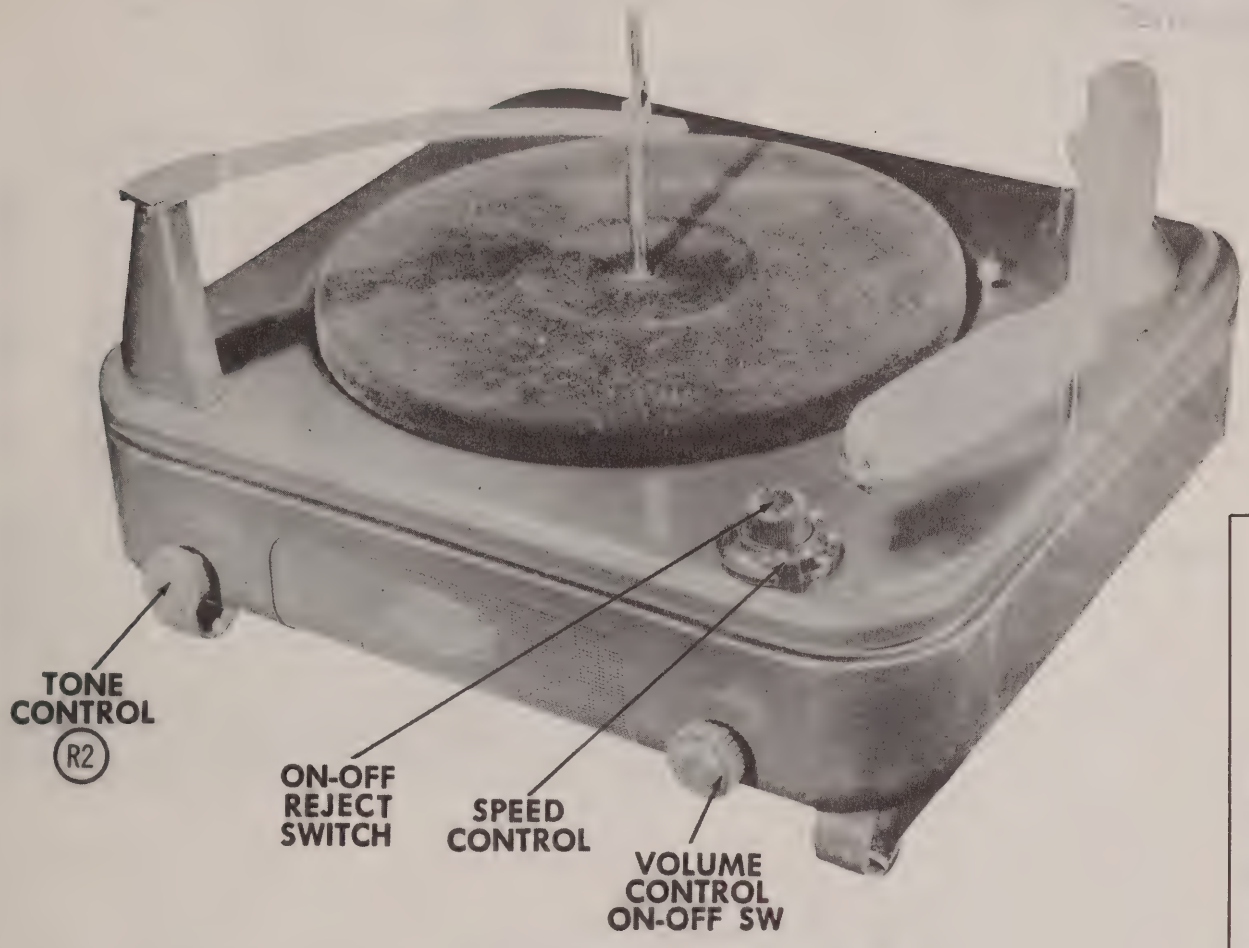

V-M
MODEL 970

TRADE NAME	V-M Model 970
MANUFACTURER	V-M Corp., Benton Harbor, Mich.
TYPE SET	AC Operated Audio Amplifier with Automatic Record Changer
TUBES (THREE)	Types 12SQ7 AF Amp., 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .23 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON V-M MODEL 950 RECORD CHANGER UNIT- SEE PHOTOFACT SET 107-FOLDER 13 OR RECORD CHANGER MANUAL CM-3

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		V-M PART No.	STANDARD REPLACEMENT		
V1	AF Amp.	2846	12SQ7GT	8Q	
V2	Audio Output	2844	50L6	7AC	
V3	Rect.	2845	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	60	150	3832	PRS150/50-30-20		EDL42215		TVA-3444	Filter (Red)
B	20	150				BR205A		TVA-1306	Filter (Green)
C	20	50							Output Cathode (Yellow)
C2	.003	600	2850	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Audio Coupling
C3A	.01		♦3614		♦PC-81				Audio Coupling
B	250								AF Amp. Plate Bypass
C									Output Grid Bypass
C4	.003	600	2850	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Tone Comp.
C5	.08	400	2894						Line Isolation

♦ Items C3A, C3B, C3C, R10A, R10B are combined in one unit.
When replacing items seperately, C3B and C3C should total 250MMF.

CONTROLS

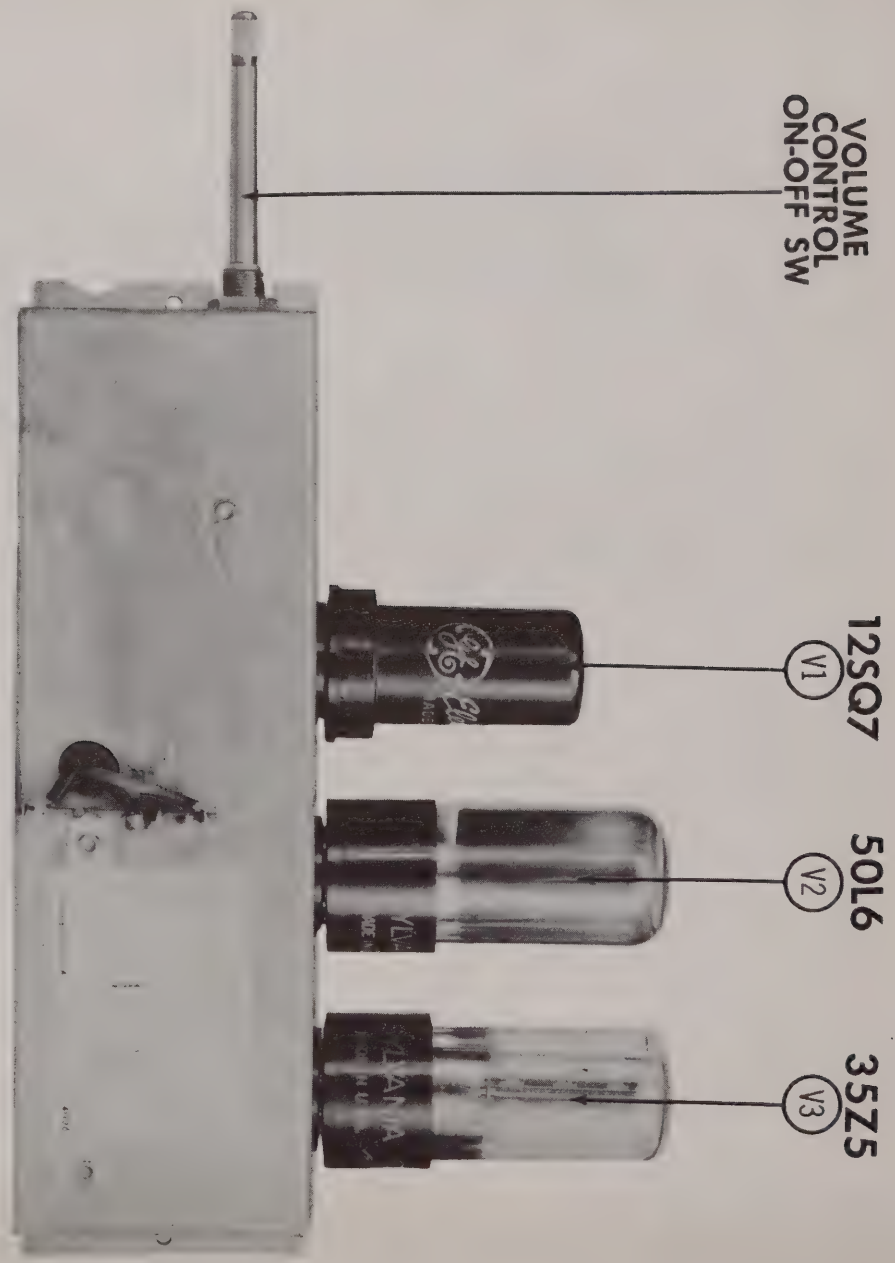
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	3611	Q13-139	AG-66-Z		Volume Controls
B	Shaft		Not Req.	Not Req.	KSS-3		Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB		Attach to R1A per instructions
R2A	500KΩ	½	3648	Q11-133	AG-58-S		Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3		Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	V-M PART No.	IRC PART No.	
R3	22KΩ	½	2914	BTS-22K	Series Phono
R4	560KΩ	½	3032	BTS-560K	Volume Control Shunt - Note 1.
R5	4.7Meg	½	2853	BTS-4.7Meg	AF Amp. Grid
R6	150Ω	½	2854	BTS-150	Output Cathode
R7	4700Ω	½	2855	BTS-4700	Filter
R8	33Ω	½	2893		Surge Limiter
R9	150Ω	5	2843	BTS-150	Filament Dropping
R10A	250KΩ	½	♦3614	BTS-250K	AF Amp. Plate
B	500KΩ	½		BTS-500K	Output Grid

Note 1. Some models use a 470KΩ resistor in this application.
♦ Items C3A, C3B, C3C, R10A, R10B are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		V-M PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	1.9KΩ	3.3Ω	210Ω	.6Ω	Parts of 3615	A-3876 ①	A-2928 ①	R0-2 ①	① Bend mounting tabs down. File out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	V-M PART No.	VIKING PART No.	QUAM PART No.	
SP1	P.M.	3.3Ω	3615	46J6	46A1	
	CONE DIA.	V. C. DIA.				
SP2	4 in. X6 in.	9/16 in.				

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	V-M PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	3691	ACD-J	A-1 A-3	W22AB	A65MG A62A	96	0-1 or S-1 and 0-3 or S-3	

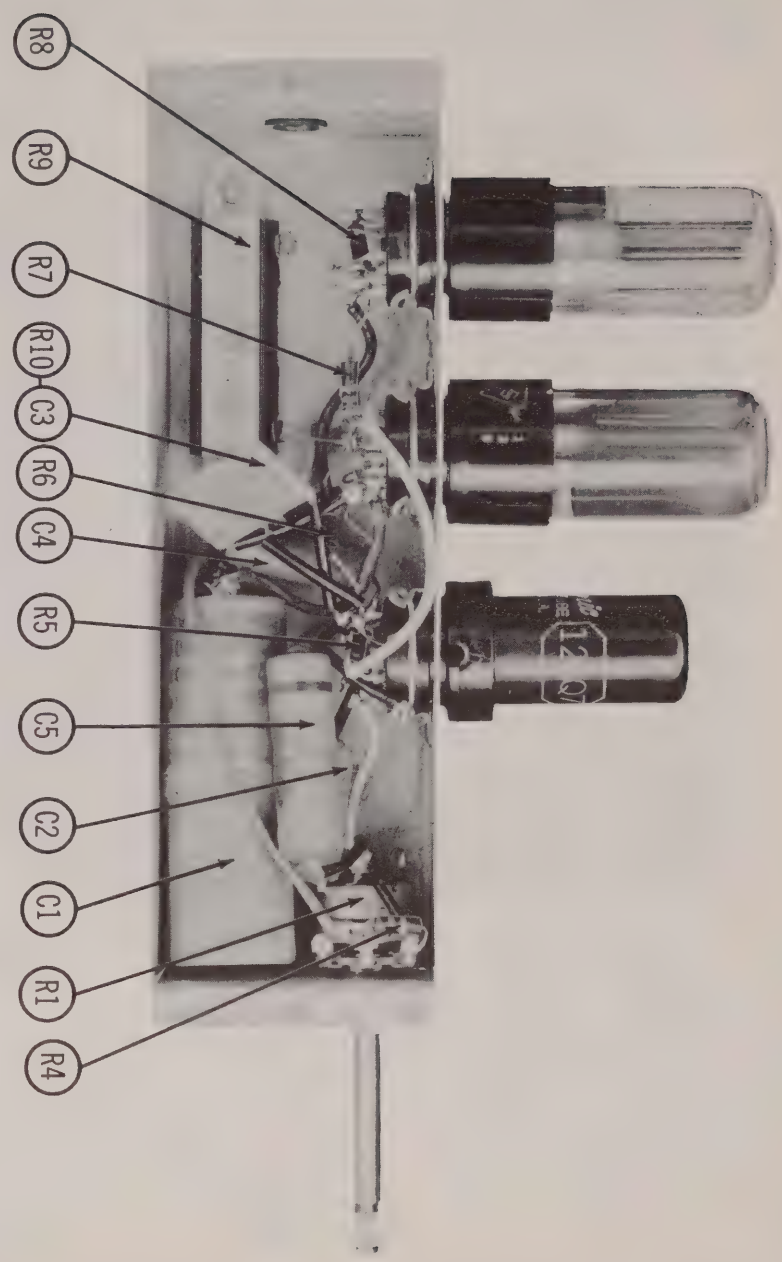
ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

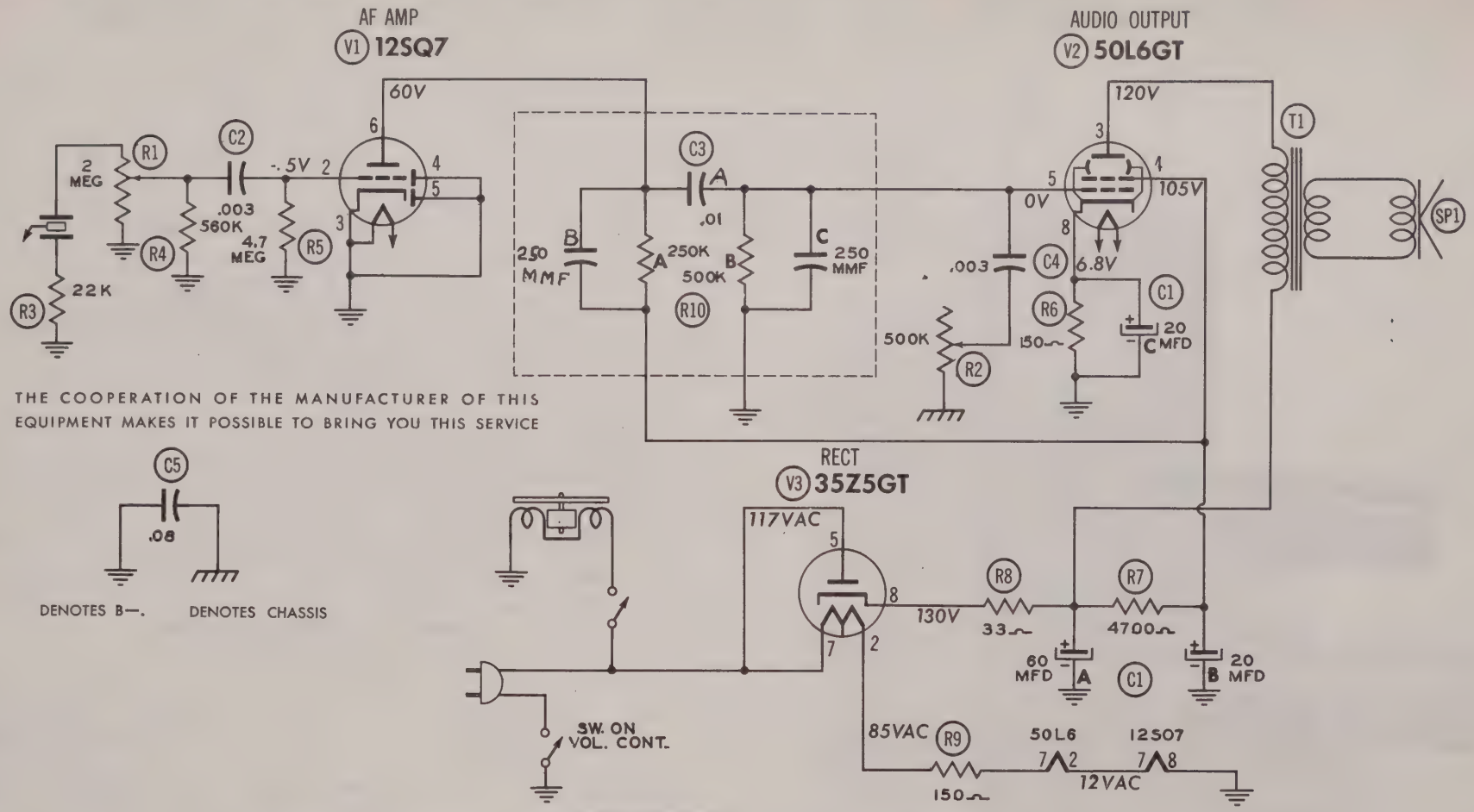
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	V-M PART No.	WALCO PART No.	JENSEN PART No.	
M2 and M3	2628 and 2629	W-30MGS and W-30A	JPS-30LP and JP-30	Microgroove Standard

CHASSIS—BOTTOM VIEW



V-M MODEL 970



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SQ7	¶0Ω	4.7Meg	0Ω	0Ω	0Ω	†250KΩ	12Ω	0Ω
V 2	50L6GT	INF	12Ω	†243Ω	†4.7KΩ	500KΩ	INF	62Ω	150Ω
V 3	35Z5GT	†33Ω	212Ω	229Ω	†33Ω	247Ω	247Ω	247Ω	70KΩ

ALL CONTROLS SET FULLY COUNTER CLOCKWISE
† MEASURED FROM PIN 8 OF V3
¶ MEASURED FROM CHASSIS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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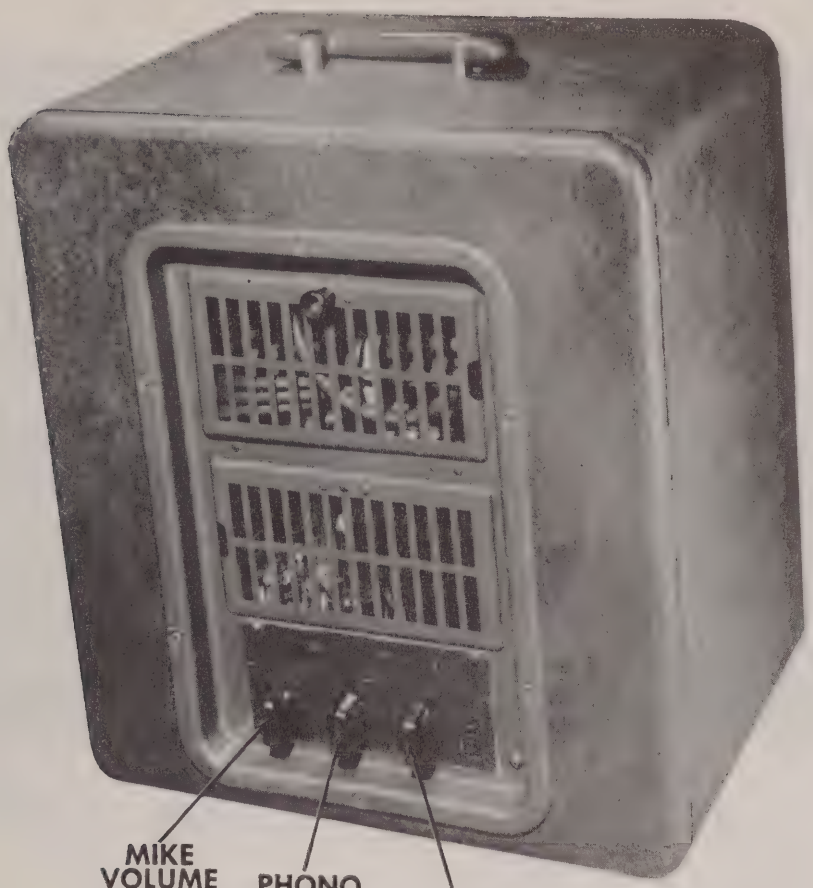
159-15

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PROPERTY OF
L. F. E. MIA...
DENVER, ...

WEBSTER-CHICAGO
MODEL 166



WEBSTER-CHICAGO
MODEL 166

TRADE NAME	Webster- Chicago Model 166
MANUFACTURER	Webster-Chicago, 5610 Bloomingdale Ave., Chicago 39, Ill.
TYPE SET	AC Operated 2 Channel Audio Amplifier
TUBES (FIVE)	Types 6AT6 1st AF Amp., 12AX7 2nd AF Amp., -Phase Inv., (2) 6V6GT Audio Output , 5Y3GT Rect.
POWER SUPPLY	110-120 Volts AC RATING .53 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	1st AF Amp.	6AT6	6AT6	7BT	
V2	2nd AF Amp.-Phase Inverter	12AX7	12AX7	9A	
V3	Audio Output	6V6	6V6	7AC	
V4	Audio Output	6V6	6V6	7AC	
V5	Rectifier	5Y3	5Y3	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WEBSTER CHICAGO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	450		AFH 4-14		UP222245		TVL-4763	▪ Filter
B	20	350							■ Filter
C	10	350							▲ Decoupling
D	10	350							Decoupling
C2	10	25		PRS25/10		BR102A		TVA-1204	2nd AF Amp. Cathode
C3	10	25		PRS25/10		BR102A		TVA-1204	Output Cathode
C4	.01	100		P288-01	D6-103	PTE4S1	GP2-333-103	2TM-S1	Audio Coupling
C5	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C6	150	500		1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	Tone Comp.
C7	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C8	.02	400		P488-02	DF-203			4TM-S2	Audio Coupling
C9	.00075	800							Tone Comp.
C10	.0022	600		P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Output Plate
C11	.015	600		P688-015		PTE6S15		6TM-S15	Line Filter
C12	.015	600		P688-015		PTE6S15		6TM-S15	Line Filter

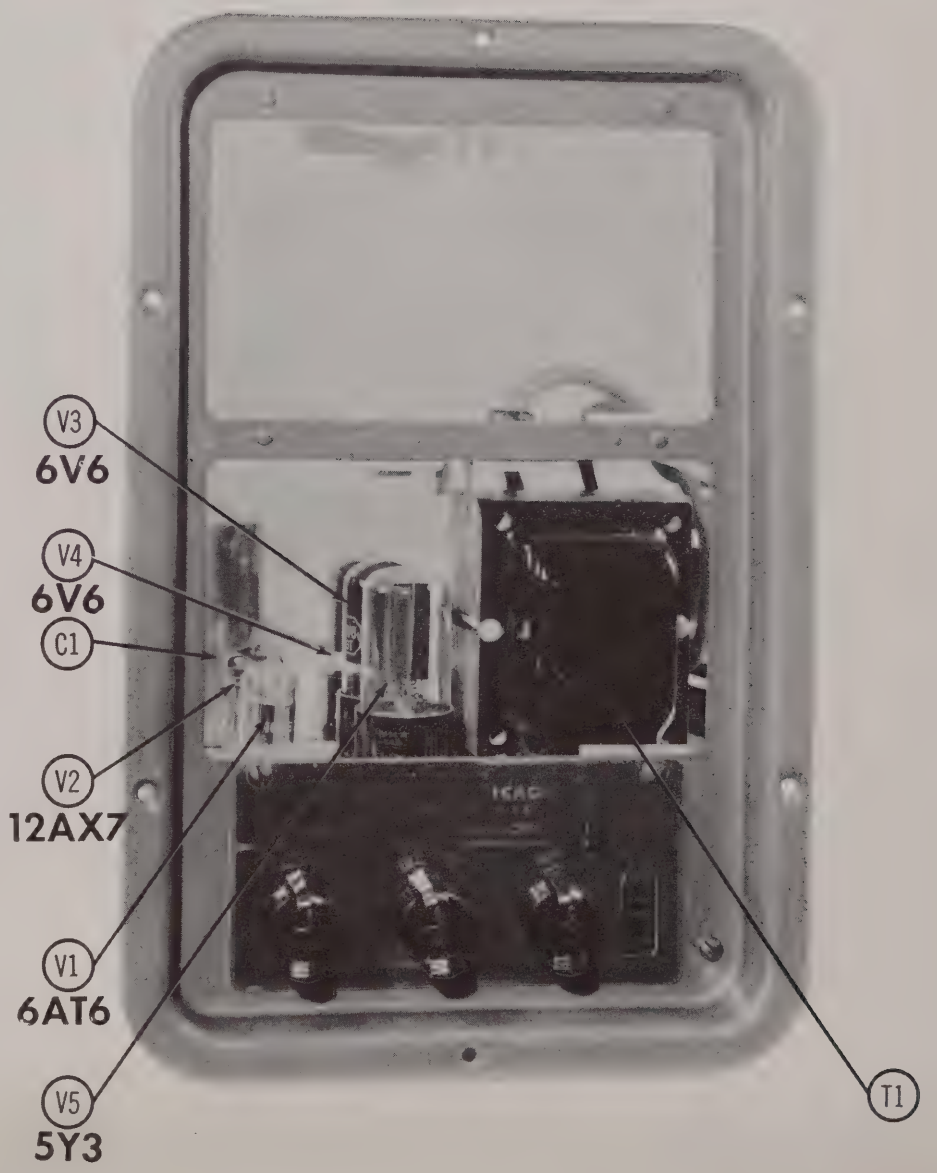
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	31P057	Q11-137	AG-61-S	AN-69	Phono Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions.
R2A	1Meg	½	31P057	Q11-137	AG-61-S	AN-69	Phono Volume Control.
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions.
R3A	1Meg	½	31P056	Q13-137	AG-63-Z	BSK-70-S	Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R3A per instructions.
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R3A per instructions.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	IRC PART No.	IDENTIFICATION CODES
R4	4.7Meg	½		BTS-4.7Meg	1st AF Amplifier Grid
R5	470KΩ	½		BTS-470K	1st AF Amplifier Plate
R6	470KΩ	½		BTS-470K	2nd AF Amplifier Grid
R7	470KΩ	½		BTS-470K	Tone Compensator
R8	2200Ω	½		BTS-2200	2nd AF Amplifier Cathode
R9	270KΩ	½		BTS-270K	2nd AF Amplifier Plate
R10	270KΩ	½		BTS-270K	Phase Inverter Plate
R11	10KΩ 5%	½		BTS-10K-5%	Phase Inverter Grid
R12	470KΩ	½		BTS-470K	Output Grid
R13	470KΩ	½		BTS-470K	Output Grid
R14	100KΩ	2		BTB-100K	Output Plate
R15	200Ω	5		1 3/4A-200	Output Cathode
R16	100KΩ	½		BTS-100K	Decoupling
R17	100KΩ	1		BTA-100K	Decoupling
R18	1000Ω	½		BTS-1000	Filter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	WEBSTER-CHICAGO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .53A	560VCT .080ADC	5VAC @ 2A	6.3VCT @ 1.5A	68P003	PC8404 ①		PV-70A

❍ Drill new mounting holes.

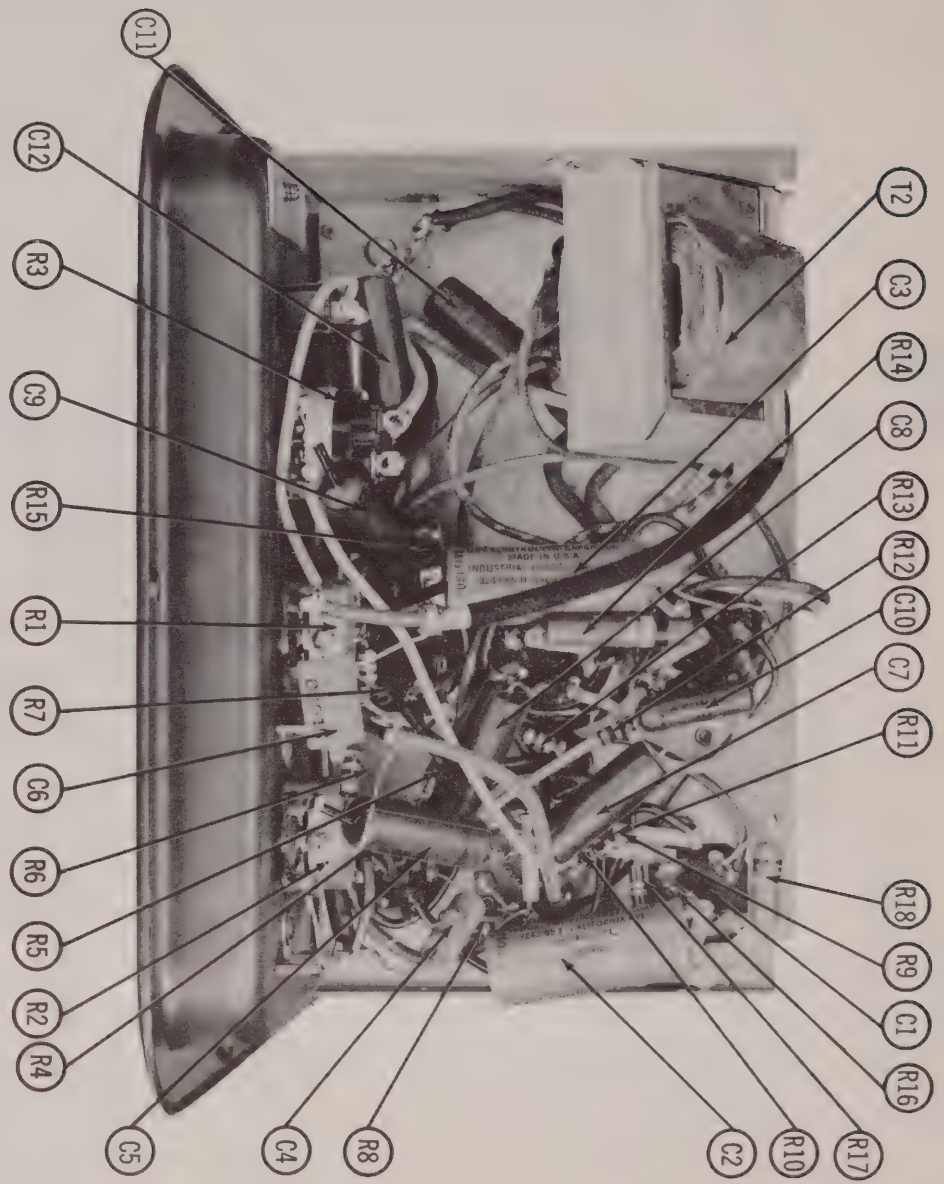
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		WEBSTER-CHICAGO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5.5KΩ C.T.	7.2Ω C.T.	300Ω C.T.	.8Ω C.T.	67P016	A-3852	A-3028 ①		① Drill new mounting holes.

SPEAKER

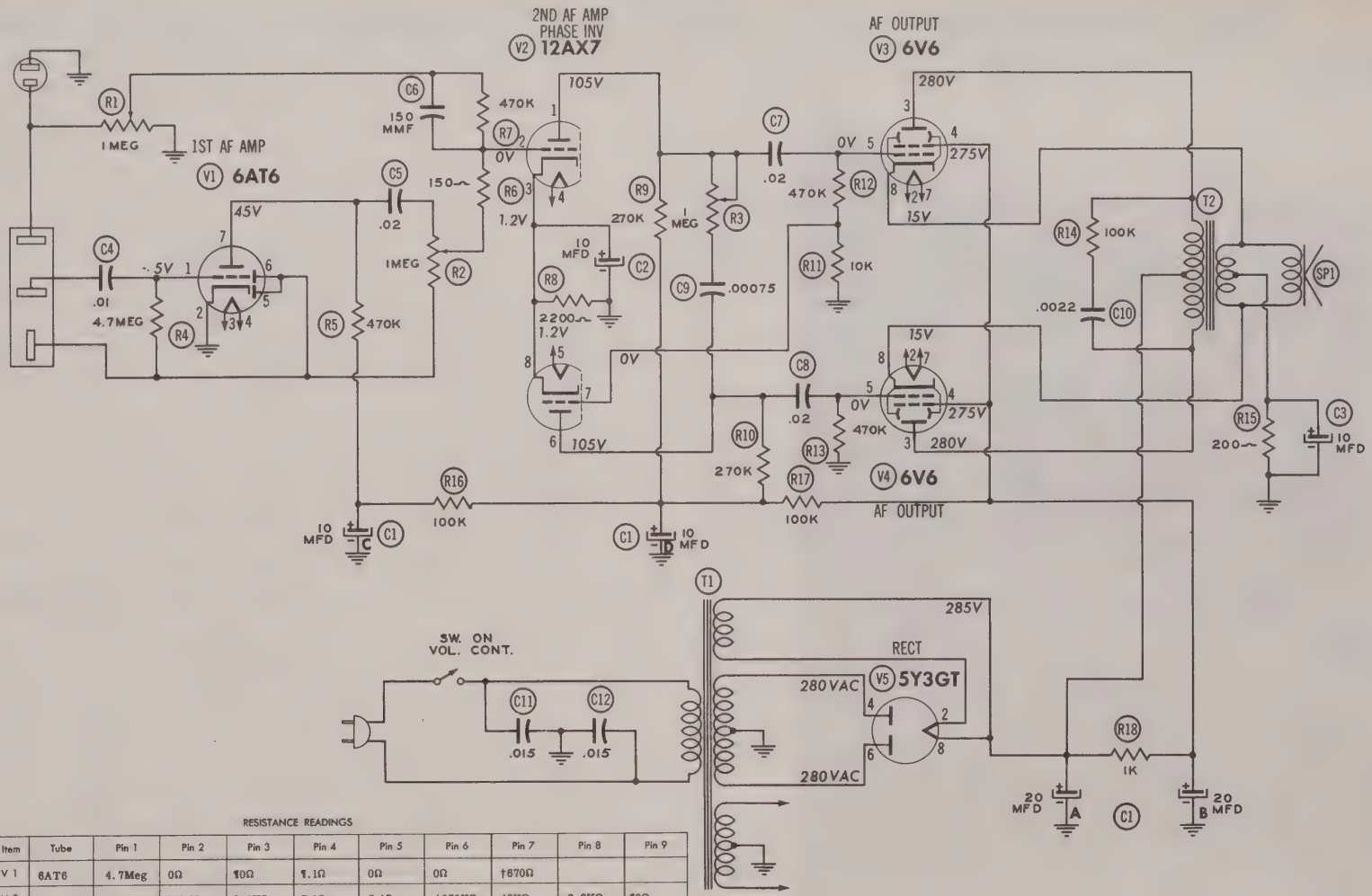
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	WEBSTER-CHICAGO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P. M.	7.2Ω	76P021	ST-119 Mod. P10-T	10A4	
	CONE DIA.	V. C. DIA.				
SP2	9½ in.	1 in.				

CHASSIS—BOTTOM VIEW



WEBSTER-CHICAGO MODEL 166

WEBSTER-CHICAGO MODEL 166



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AT6	4.7Meg	0Ω	¶0Ω	¶.1Ω	0Ω	0Ω	†670Ω		
V 2	12AX7	†370KΩ	250KΩ	2.2KΩ	¶.1Ω	¶.1Ω	†370KΩ	10KΩ	2.2KΩ	¶0Ω
V 3	6V6GT	INF	¶.1Ω	†150Ω	†1KΩ	480KΩ	†100KΩ	¶0Ω	200Ω	
V 4	6V6GT	INF	¶.1Ω	†150Ω	†1KΩ	470KΩ	†670KΩ	¶0Ω	200Ω	
V 5	5Y3GT	INF	120KΩ	200Ω	67Ω	†370KΩ	64Ω	INF	120KΩ	

ALL CONTROLS SET FULLY COUNTER-CLOCKWISE.
¶ MEASURED FROM PIN 7 OF V4.
† MEASURED FROM PIN 8 OF V5.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE.

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159-16

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PROPERTY OF
L F BLANKENSHIP
3824 MEADE ST
DENVER, COLORADO

WEBSTER-CHICAGO
MODEL 210

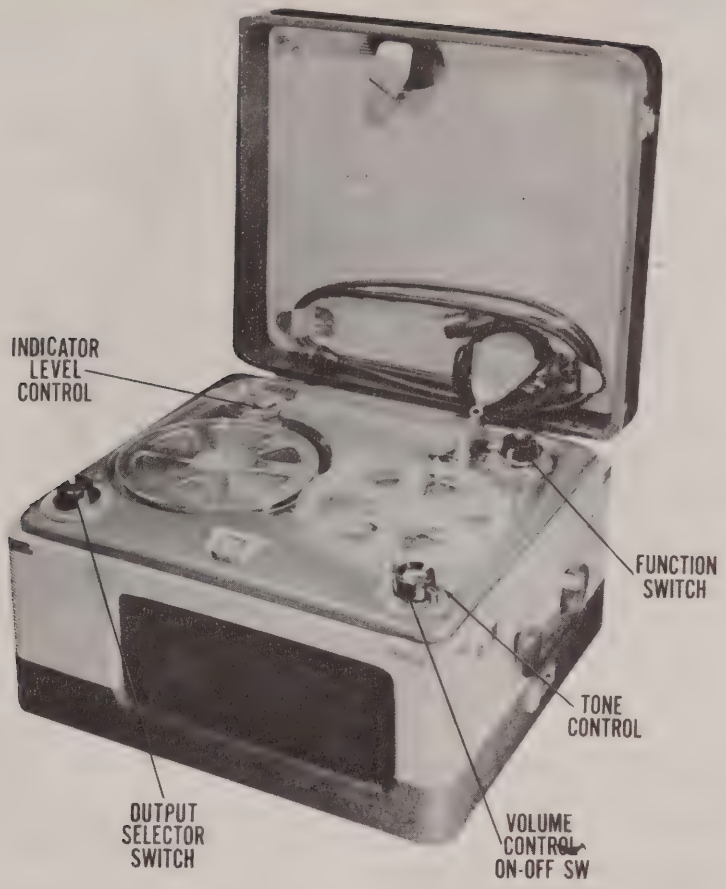

Figure 1

WEBSTER-CHICAGO
MODEL 210

GENERAL INFORMATION

The Webster-Chicago "Web-Cor" Model 210 Tape Recorder is designed to record two tracks of sound on the standard width (1/4") recording tape. The "Web-Cor" uses two motors and two Record-Play-back heads in conjunction with the Tape Directional Control to permit dual track recordings. This eliminates the operation of turning the reels over and rethreading the tape in order to use the second half.

Recordings may be made at either 7-1/2" per second for music and quality recordings or 3-3/4" per second where quality of the recording is not necessary such as speeches, popular music etc. Using a 7" reel at 7-1/2" per second gives 1/2" hour playing time one way or 1 hour by using dual track recording. At 3-3/4" per second gives 1 hour playing time one way or 2 hours-dual track recording.

Fast Forward, Fast Rewind and Automatic Shut-Off are also features of the "Web-Cor".

Power Supply for most models is 105-120 Volts, AC. operation. Special models are designed for 210-240 Volts AC. operation.

Manufactured by: Webster-Chicago
5610 West Bloomingdale, Chicago 39, Ill.

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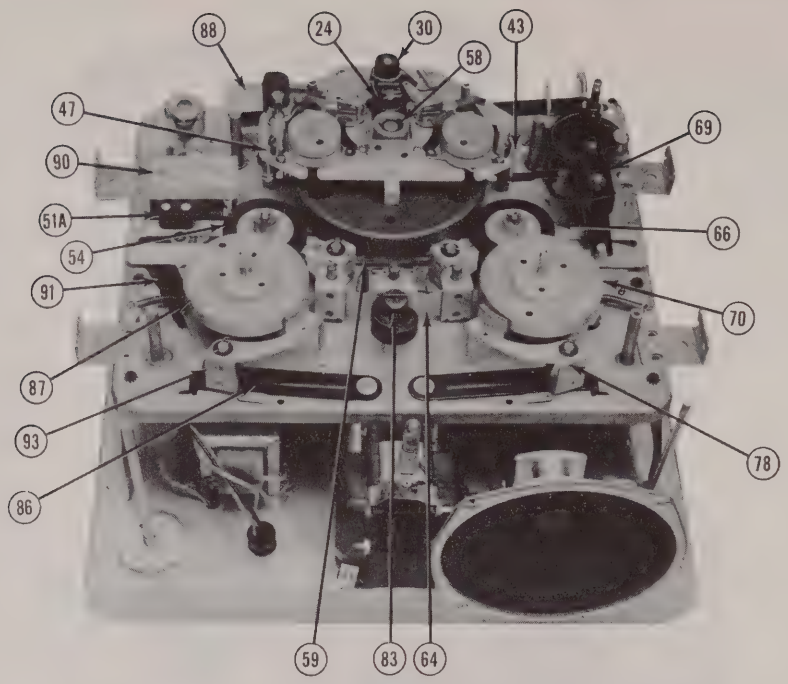

Figure 2

OPERATING INSTRUCTIONS

To Prepare the "Web-Cor" for Recording -

1. Remove the lid from the carrying case and place the recorder on a level table to insure proper action of the mechanism.

2. Connect the power cord (supplied with recorder) to the male plug located on the left side of the carrying case, then plug the other end into a convenient outlet supplying 110 Volts AC.

3. Check the speed change adjustment (83) to insure the proper tape speed 3-3/4" or 7-1/2" per second.

4. Place a reel of tape on the left hand reel cup (5).

NOTE: The reel, when placed on the recorder, must unwind clockwise when the tape is pulled from it. Also the metallic coated side (dull side) must face toward the center of the reel. If the dull side of the tape faces outward, thread the tape on the machine with a half twist so the dull side faces inward on the take up reel, then wind all of the tape on the take up reel. When the tape is wound on the reel, remove the reel, turn it over and place the reel on the left hand cup (5).

5. Place an empty reel on the right hand cup, then thread the tape through the slot between the front and rear trim covers (2) and (3).

6. Insert the tape into one of the radial slots of the empty reel and by using a pencil, hold the tape in place and rotate the reel several revolutions clockwise to anchor the tape securely.

To Make a Recording -

1. After the recorder has been properly threaded, turn the On-Off-Volume control knob (13) to "On".

2. Plug the microphone into the input receptacle (three prong socket) located on the right side of the carrying case.

3. Push down on the "R" (record) safety button (12) and turn the control knob (11) to the (R)ight.

4. Turn the Output selector switch to position 4 if monitoring is desired, when recordings direct from radio or record player are made. See ("Output Selector Switch" -4).

5. Hold the microphone 8" to 12" from the mouth when making a recording.

6. Turn the volume control knob (13) clockwise until the Magic Eye recording level indicator just closes on the loud signals.

NOTE: Do not over record or the recording will sound distorted when played back.

7. After the tape has been recorded going one direction, a second sound track may be recorded by reversing the direction of the tape. This is done by holding the "R" (record) safety button (12) down and turning the control knob (11) in the opposite direction. Recording two tracks of program material on the tape doubles the playing time of a reel of tape with no loss in frequency response or quality.

NOTE: It is advisable to stop or reverse the direction of the tape before the tape is completely unwound from the reel. By doing this the tape will not have to be rethreaded.

Recordings Made Directly from Radio or Record Player -

Radio programs should be recorded directly from the

receiver circuit instead of by means of the loudspeaker and microphone. An accessory cord No. 2901 connected across the volume control of the receiver and the other end plugged into the input receptable (three prong socket located on right side of carrying case) makes it possible to record independent of the volume control setting of the receiver.

This same cord can be used to record direct from a phonograph record player.

NOTE: The accessory cord No. 2901 includes the 22,000 ohm 1/2 watt resistor necessary between terminals 1 and 2 of the input plug.

To Stop the Recorder -

1. To stop the recorder any time during operation, merely turn the control knob (11) to the Stop position. When the control knob is turned to Stop when a recording is being made the "R" (record) safety button will move up. Therefore, to continue with a recording, this button "R" must be depressed when the control is turned.

Fast Wind or Rewind -

1. To run the tape at fast speed in either direction push the control knob (11) down, then turn it to (R)ight or (L)eft as desired. Do not push down on the "R" (record) safety button (12).

To Play Back a Recording -

1. Properly thread the tape on the machine.

2. Turn the "Output" selector (6-7) to position 1. This will play the recorded material through the speaker of the recorder. Also see "Output Selector Control" under "Functions of Principal Parts".

3. Turn the tape control knob (11) toward the direction the tape should run, (L)eft or (R)ight.

4. Adjust the Volume control (13) and Tone control (14) to suit.

NOTE: On-Off-Volume control (13) is the round knob and the Tone control (14) is the wing knob.

Erasing Recorded Material -

There are two recording heads incorporated in the "Web-Cor". When the tape winds on the right hand reel, the upper half of the tape is recorded by the Left Recording head. During this operation the right record head is inoperative. As the tape winds on to the left hand reel, the right recording head records the lower half of the tape. In this case the left recording head is inoperative. However, in each case the recording head is so constructed that a recording of the particular sound track is erased automatically before it reaches the recording coil. This makes it possible to make a new recording on tape that has been previously recorded.

If it is desired, any portion of the tape, or an entire reel, of recorded material can be erased as follows:

1. Rewind the tape to the start of the recording.

2. Turn the Volume control knob (13) down to "zero" volume.

3. Push down on the "R" (record) safety button (12) and turn the control knob (11) to the position (R) or, (L) to which the recording was made.

FUNCTION OF PRINCIPAL PARTS

Index Control Assembly -

The index control assembly (38) is manually actuated when the control knob (11) is turned. Its function is as follows:

1. When the control knob is turned to the right or left, the following parts are actuated. The index control assembly (38), the control link (42) and in turn the crank (44). The cam (30) which is fastened to the hub of the crank (44) is then turned, forcing the pressure roller arm (26) inward, causing the pressure roller (24) to engage the capstan (58). Together the pressure roller (24) and capstan pulls the tape past the recording head at a constant speed.

Adjustment of Pressure Roller -

The pressure roller should be parallel with the capstan to maintain proper operation. If the pressure roller is not parallel with the capstan, causing the tape to climb or crawl down the capstan, carefully bend the pinch roller shaft until the adjustment is correct.

2. At approximately the same time the pinch roller (24) is moved inward, the pressure roller and pad control (45), also connected to the crank (44), is pivoted on its mounting, causing the pressure pads (21) and (23) to contact the lamination of the left record head when control is turned to left.

NOTE: An improved erase pressure pad assembly was used soon after production of the "Web-Cor" began. The original assembly permitted the movement of the tape directional control to affect the pressure of the erase pad, effecting the speed of the tape and introducing wow. It is recommended that in case the earlier type pressure pads (17 and 18) and (21 and 23) are used and wow is a problem, replace with the new type (Listed in Parts List).

3. The main guide crank (103), which is fastened to the control shaft (40), turns with the control shaft and the index control assembly (38). The stud (103A) of the crank assembly (103) which is positioned between the fingers of the head switch actuating crank (109), actuates the four pole double throw rotary switch and connects the proper head into the record-playback circuit.

4. The slide cam actuating lever (69) is also pivoted by index control assembly (38), which in turn moves the cam plate and slide assembly (51). The cam slide (51) then operates the brakes, engages the idler wheels with the proper motor shaft, and causes the bakelite control (51A) to actuate the "take-up" motor control switch (90).

5. The top cut out portion of the cam lever (69) resets the automatic stops, if they have been tripped, when the tape direction control knob (11) is turned to Stop.

The Sliding Cam Plate Assembly (51) -

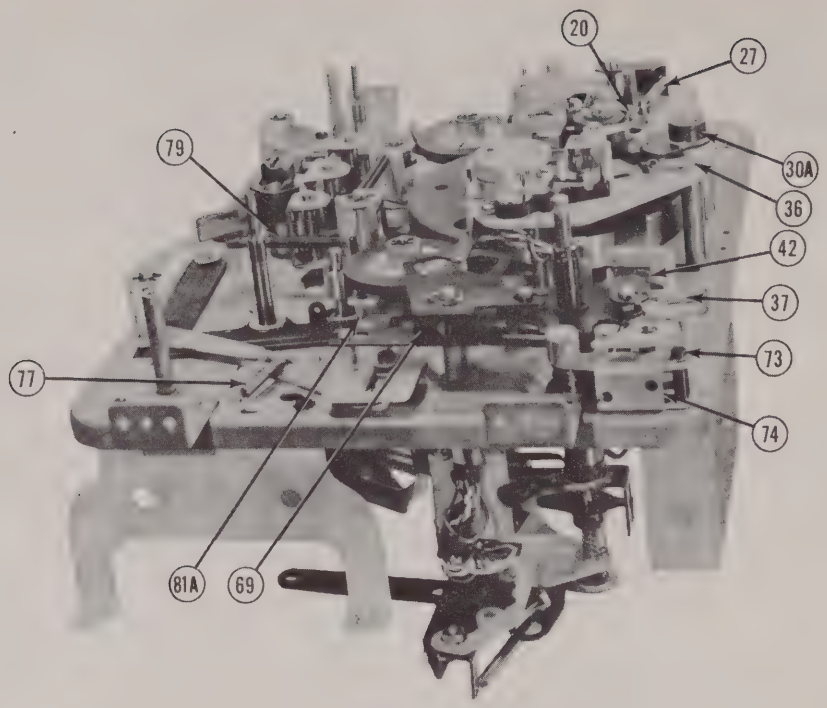

Figure 3

The sliding cam plate assembly (51) which is actuated by the index control cam (38) through the cam actuating lever (69), operates as follows:

1. When slide cam assembly (51) is in the "Stop" position the bakelite switch oontrol (51A) is positioned so that the contacts of the motor control switch (90) are open. This removes the shunt from around resistor (R34) which reduces the voltage to the motors, reducing their power or pull. When the control is turned to the right the bakelite switch control (51A) moves, against the bottom switch contacts of switch (90) closing it. Full power is then restored to the left motor (100). The left motor then drives the idler (54), the capstan, and drum assembly (58). This pulls the tape past the left record head at a constant speed. The right motor still running at reduced voltage drives the take up reel chuck (70) to take up the tape.

This prevents the take up reel from pulling on the tape causing "Wow". If the tape direction control (11) had been turned to the left, the voltage to the motors and the driving system would have been reversed.

2. When the control knob is turned to the right, the contour of the slide cam (51) permits the stud (85A) of the left bell crank (85) to be pulled into the recess (51D) of the slide by spring (82). The idler wheel (54) is pulled into engagement with the left motor pulley and the capstan and drum (58) by spring (59). This pulls the tape past the left recording head at a constant speed when the mechanism is in Play or Record position.

3. At the same time idler pulley (54) engages the motor pulley and drum, the wheel of the drum and wheel assembly (70) engages the right motor pulley. Due to the reduced voltage to the right motor, the tape is wound on the take up reel without any excess pull on the tape to cause "Wow".

4. In this position, (as described in step 3) the stud of the left brake actuating lever (91) is positioned at point (51C) of the slide (51). In this position the left brake shoe should clear the chuck about 1/32". The stud of the right brake actuating lever (76) is engaged by the right slide (51B). Thus blocking any action of the right brake.

5. When the tape direction control is turned to "Stop" the idler wheels are moved to neutral position and the left brake is applied to the left chuck, by spring (89) thus stopping the tape.

NOTE: If the tape direction control had been turned to the Left, the action of the tape drive mechanism and brakes would have been reversed.

Output Selector Switch -

1. No. 1 position permits listening to the playback of recordings through the internal speaker of the "Web-Cor" Model 210.

2. No. 2 position connects the 500 ohm winding of the output transformer (2 watts of audio) to the output socket, (two prong socket located on the right side of the carrying case) for an auxiliary loudspeaker. A 500 ohm to voice coil matching transformer is required.

3. No. 3 position connects a high impedance voltage to the output receptable for playing the Model 210 through a public address system, high fidelity amplifier, or your radio receiver.

4. Position No. 4 is a monitor position for use when recording from radio or phonograph. When used with microphone, feedback and squealing may occur and will be recorded on the tape.

Record Safety Button (12) -

1. When making a recording the record safety button

(12) must be pushed down and the control knob (11) turned to the desired direction. The crank (108) which is fastened to the end of the shaft (67) is push down by the safety button causing the stud on the crank to engage the slot of record-listen lever (113). These parts are then actuated when the control knob is turned. This moves the record-listen switch which is normally in listen position, to record position. The crank and record safety button are held down during the recording process by the engagement of the record safety lock (104) with the rotary switch bracket (110). When the tape direction control is turned to Stop, the record listen switch is returned to the listen position. The record safety button (12), shaft (67), lock (104), and crank (108) are then raised by the compression spring (107).

Tape Speed Control -

Two tape speeds are available, 7-1/2" per second for music and quality recording and 3-3/4" per second for speech and popular music. To obtain the desired speed setting insert a coin or screw driver in the slot of the speed change cam (83) and turn it to the desired speed setting as indicated by the arrow on the cam (83) pointing to number 7-1/2 or 3-3/4 stamped on the top plate.

The contour of the cam (83) lifts or lowers the speed change lever (64) which in turn lifts or lowers the idler wheels (54) and (66) to contact the motor shaft or the bushings on the shaft. The difference in the diameter of the motor shaft or the bushing causes the speed change.

The crank (84) which is fastened to the end of the cam shaft actuates the equalization switch (M5) in the amplifier to provide proper equalization for the 3-3/4" or 7-1/2" per second speeds.

NOTE: The speed control shaft (83) should be turned only when the tape direction control is at the stop position. Also recordings made at a particular speed must be played back at that speed.

Automatic Stops -

Some recorders produced had the automatic stops shorted out, due to failure of certain material needed to operate the stops. Model 210's are now being made with the automatic stop operative, but the stops are to be used only at normal record-playback speeds of 3-3/4" or 7-1/2" per second.

NOTE: The stops will operate at fast forward speed but each time the stops are actuated the tape will be broken, therefore, each time the stops are actuate at fast forward a certain amount of tape will be lost.

Recorders with the automatic stops inoperative may be put into operation for use at normal tape speeds 3-3/4" or 7-1/2" per second as follows:

1. Remove the top cover from the record. See instructions on "How to Remove The Recorder from the Carrying Case".

2. Remove the metal cover for the automatic stop switch (88). This switch is located behind the left record head.

3. Cut or remove the jumper which shorts out the switch and replace the switch cover.

4. If the recorder does not have a jumper across the switch it will be found under the amplifier. In this case, remove the mechanism from the carrying case. See instructions on "How to Remove the Recorder From The Carrying Case".

5. Turn the mechanism over and remove the jumper across the 3-prong receptacle for the motor lead plug. The automatic stop switch will then operate.

6. Replace the mechanism and the top plate.

7. Make an 8" leader loop at the end of the tape, fastening it with splicing tape. Place the loop around the hub of the reel, then wind on several turn of tape. The stops will operate at the end of the first half of the tape making it unnecessary to rethread before reversing the direction control to record or playback the second half.

Operation of the Automatic Stops:

When the tape direction control is turn to left or right, the cam plate lever (69) is pivoted to a position where the roller of the automatic stop lever (47) is free to move in the cut out of the cam plate lever (69). When the looped end of the tape is reached the tape is pulled against the pin of the right crank (43) or (47) depending on direction tape is running. This in turn actuates the left crank and automatic stop lever assembly (47) and stop switch (88), shutting off the entire recorder.

NOTE: The automatic stops are reset automatically by the cam plate lever (69) when the tape direction control is turned to stop. This should be done as soon as possible after recording or playing back a recording.

How To Remove The Recorder From The Carrying Case -

Removing the top cover:

1. Push down on the control knob (11) and turn it to one of the Fast Wind position.

NOTE: This is merely to give room to loosen the set screw in the "R" (record) safety button (12) without damaging the plastic part of the control knob (11).

2. Use a No. 8 Bristol wrench to loosen "R" button set screw then remove the "R" button (12).

3. Turn the control knob (11) back to Stop.

4. Loosen the two set screws in the knob (11) with a No. 8 Bristol wrench, then remove the knob.

5, Remove knobs (6), (7), (13) and control (14) by pulling straight up on them.

NOTE: When replacing the control shaft (14) be sure the two indented portion, on the end of the shaft (14) engages the slots on the tone control.

6. Remove the mounting screws from the head mechanism covers and remove the covers.

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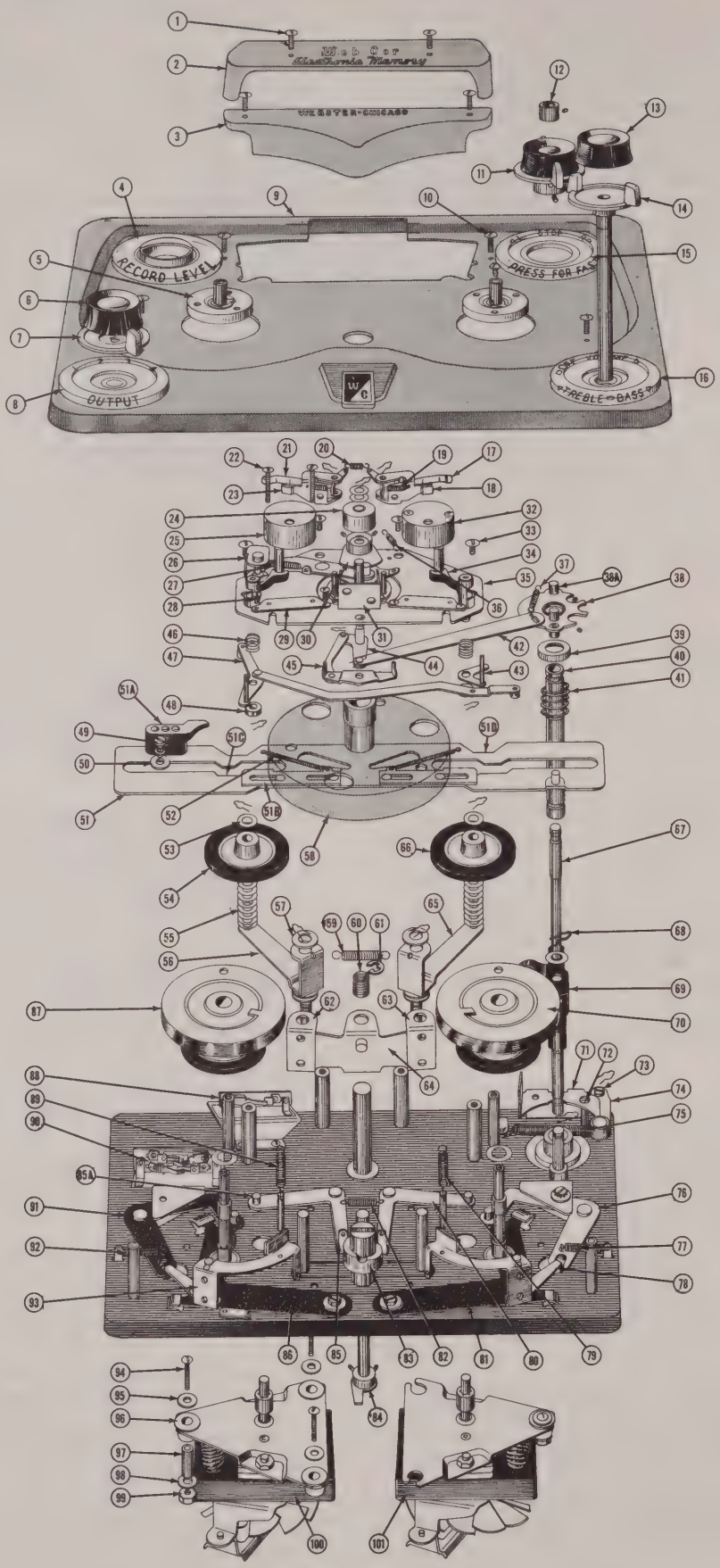

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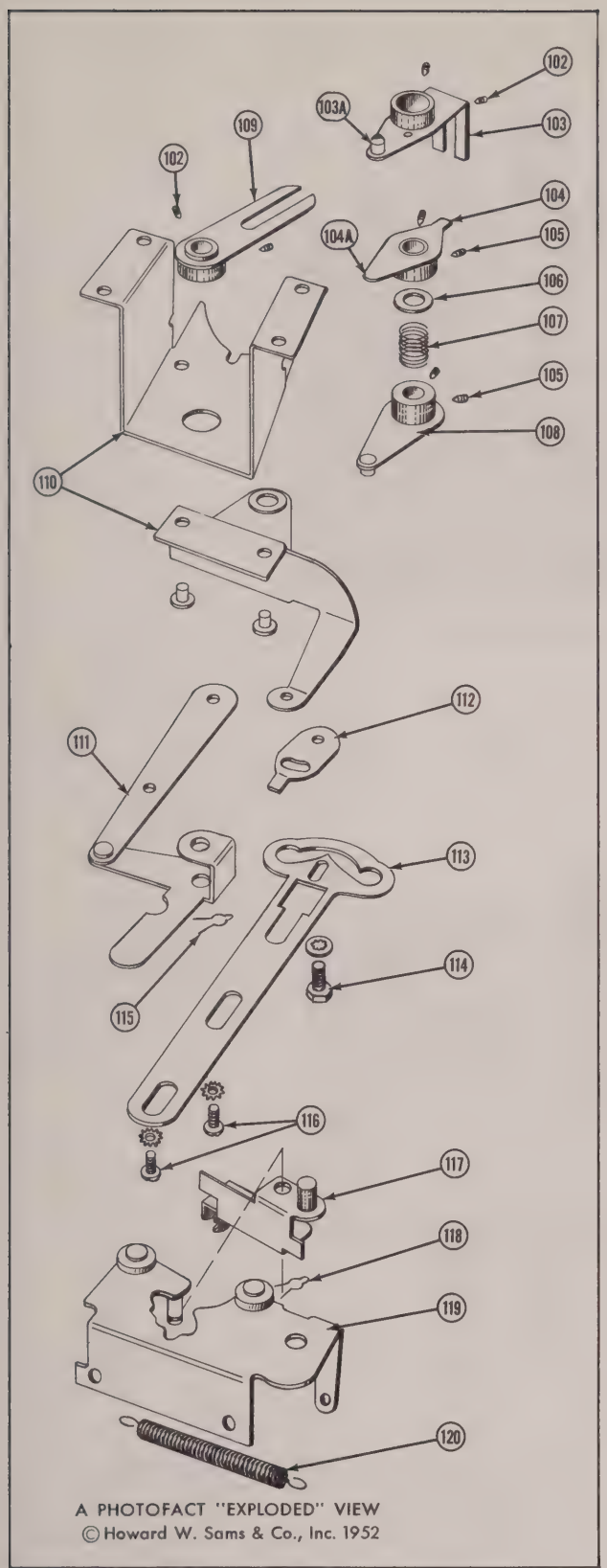

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Exploded View of Tape Control Mechanism

7. Remove the four mounting screws holding the top plate in place and remove the plate.

Remove the mechanism as follows:

1. Remove the wood screw which holds the speaker to the carrying case.

2. Remove the two screws in each side of the case and the four in the bottom.

3. Carefully lift the mechanism from the case.

NOTE: Be sure to save the fibre spacers, if used, and re-insert them when reassembling where necessary.

To Replace Tubes or The Fuse -

1. To replace tubes or the fuse, remove the protective grille on the bottom of the carrying case.

2. A type 3 AG 2 ampere fuse is required. The fuse holder is removed by turning it in the direction as indicated on the end of the holder.

To Adjust the Centralized Tape Direction Control And Record Safety Switch Assembly -

If any of the fingers or parts associated with this control binds or are accidentally forced out of adjustment, the entire assembly should be checked and readjusted.

1. Remove the mechanism from the carrying case. "See" (How to Remove The Recorder From The Carrying Case).

2. Check the front, top, and bottom studs of the index control assembly (28) to see if they fit smoothly between the fingers of the slide actuating lever (69), when the control (11) is pushed down for "Fast Forward" and when returned to "Stop". If the studs binds during this operation, loosen the lock-nut of the eccentric adjustment post (73) and turn the adjustment post to position the studs. Tighten the lock-nut. See Figure 3.

3. If, after the above adjustment has been made, stud (38A) of the index assembly (38) binds in the hole in the head assembly control link (42), the following adjustment should be made: See Figure 3.

(a) Use two No. 8 Bristol wrenches to alternately loosen and tighten the off center screws (30A) to turn the cam and hub assembly (30) which is coupled to and moves the link (42). This will position the hole in the link (42) for free movement of the stud (38A).

4. The rounded end (104A) of the record control lock (104) must move freely through the indentation in the switch bracket (110) when the "R" button is pushed down and released. If the control lock (104) binds on the switch bracket during this operation, loosen the set screws (102) of the crank assembly (103) and turn the assembly (103) with your hand to obtain the proper positioning of the lock (104). Tighten the set screws.

5. The stud (103A) of the main guide crank (103) should move smoothly between the fingers of the rotary head switch control (109) when the control (11) is pushed down for "Fast Forward". If the stud (103A) and switch control (109) fingers bind, loosen the set screw in the switch control (109) and position the control fingers so the stud (103A) is free to move up and down. Tighten the screws.

6. Check the stud of the Record and Listen switch crank (108) to see if it is centered in the apex of the slot in the adjustable switch lever (113). If the stud is off center use two No. 8 Bristol wrenches to alter-

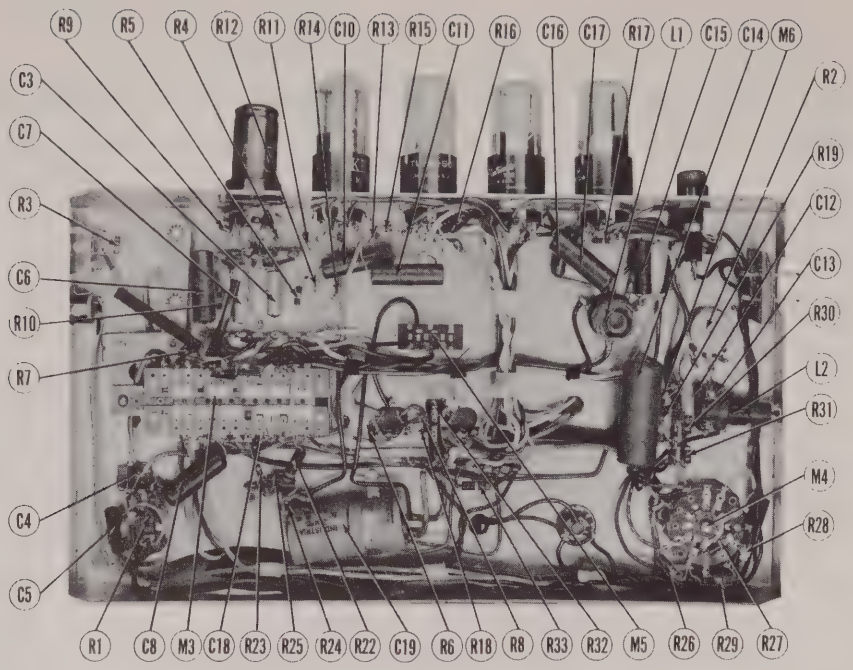


Figure 4

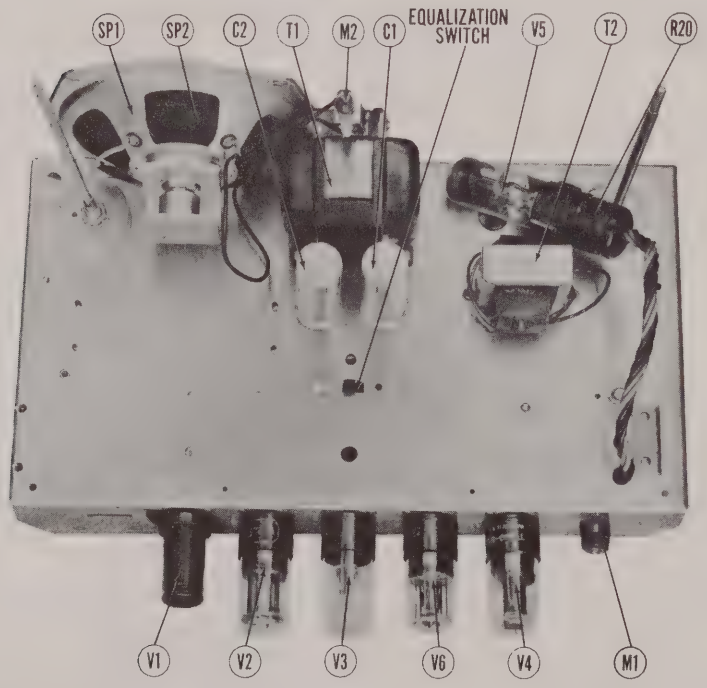


Figure 5

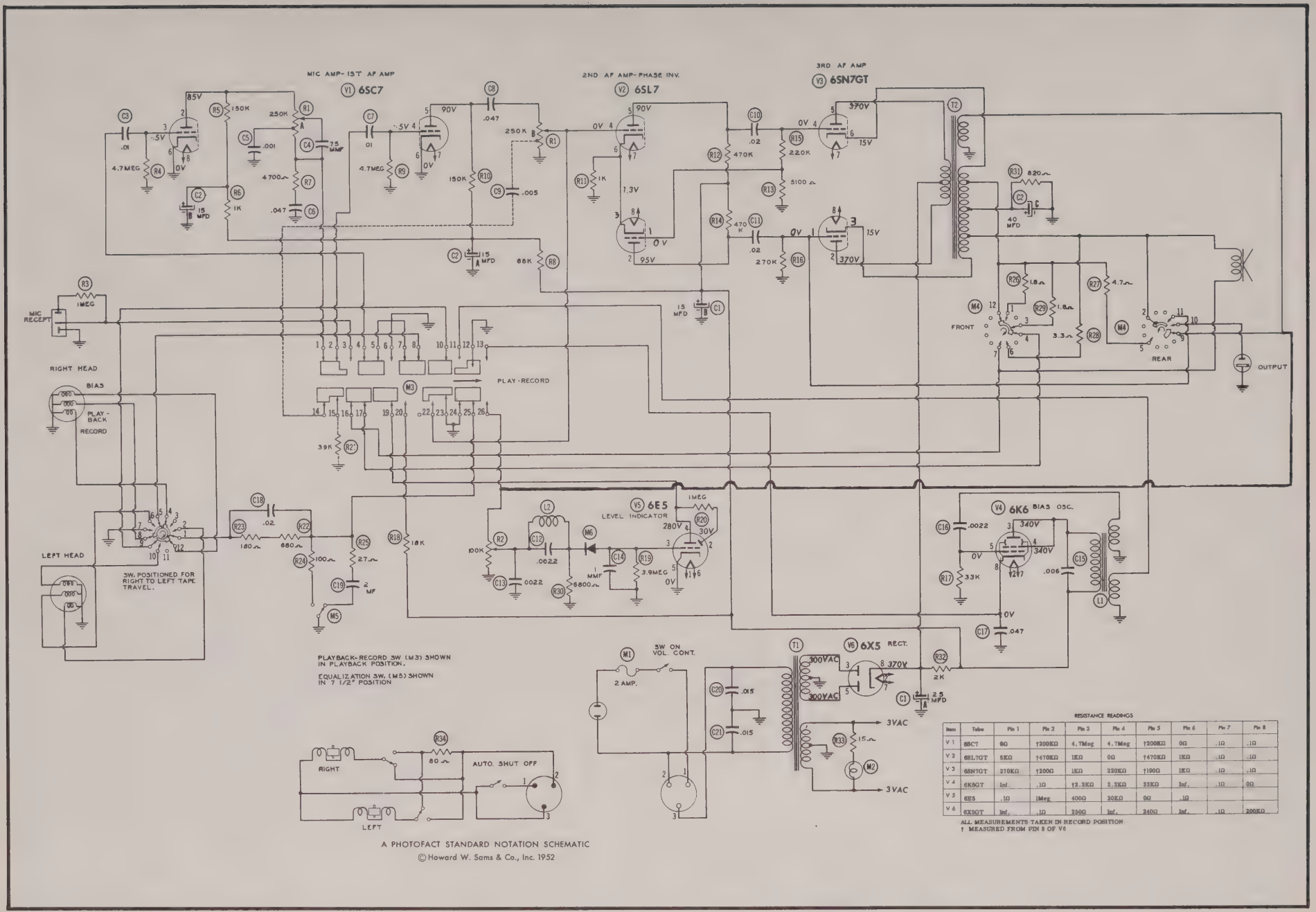
nately loosen and tighten the eccentric or off-center adjusting screws of switch crank (108).

7. If the stud of the Record and Listen switch crank (108) fails to slide into the slot of the lever (113), loosen the two screws (116), making sure that the Record and Listen switch is fully open in the "Listen" position. Move the lever (113) to a position where the stud will slide into the slot of lever (113) without any binding. Tighten the screws.

8. The toggle (117) and the tension spring (120) together, insure proper movement of the Record and Listen switch. To adjust the toggle, press down on the "R" then turn the control (11) to the (R)ight or (L)eft. Hold the adjustable plate (112) and lever (113) in position then loosen the screw (114) slightly and move the toggle (112) until the spring hook is within 1/8" to 1/4" of the amplifier chassis. Tighten the screw and put the recorder into and out of the "Record" position several times to make sure the adjustment is correct.

Lubrication -

The Web-Cor Model 210 has been well lubricated at time of manufacture and should give long service without additional lubrication; however, in case of extreme usage, replacement of parts or when it is needed, as indicated by binding of parts, the recorder



Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	†200KΩ	4.7Meg	4.7Meg	†200KΩ	0Ω	.1Ω	.1Ω
V 2	6SL7GT	1MΩ	†470KΩ	1MΩ	0Ω	†470KΩ	1MΩ	.1Ω	.1Ω
V 3	6SN7GT	270KΩ	†200Ω	1MΩ	220KΩ	†190Ω	1MΩ	.1Ω	.1Ω
V 4	6K6GT	Inf.	.1Ω	†2.2MΩ	2.2MΩ	35KΩ	Inf.	.1Ω	0Ω
V 5	6E5	.1Ω	1Meg	400Ω	30KΩ	0Ω	.1Ω		
V 6	5X5GT	Inf.	.1Ω	350Ω	Inf.	240Ω	Inf.	.1Ω	200KΩ

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WEBSTER-CHICAGO
MODEL 210

should be cleaned with carbon tetrachloride and lubricate as follows.

CAUTION - Do not allow carbon tetrachloride to come in contact with the rubber drive wheels as carbon tetrachloride will seriously damage rubber surface. Rubber surfaces should be cleaned with alcohol.

Use a drop or two of No. 10 oil on the following:

1. Motor Bearings.

2. Brake shoe (78) and (93) pivot pins.

3. Bearing surfaces of drum and wheel assemblies (70) and (87).

4. Bearing surfaces of the idler wheels (54) and (66).

5. All pivot points of the following-idler mounting arms (56) and (65), crank arms (62) and (63), and the speed change lever (64).

Use a good high temperature lubricant on the following:

1. Sliding surfaces of the cam and slide assembly (51).

2. Frictional contacts of the reel arms (81) and (86).

3. The point of contact between the brake levers (78) and (93) and actuating levers (76) and (91).

4. Contour of cam (30).

5. Frictional contact of the pressure roller arm assembly (26).

6. Roller and pivot point of the arm and roller assembly (74).

7. Contact surfaces of items (71), (38), (69), (103), (108), (117) and (119).

CAUTION: Avoid over lubrication, as this may cause the parts to gum up, thus preventing the mechanism from functioning properly. Do not allow grease or oil to come in contact with any of the rubber tires or any of their contacting surfaces. If grease or foreign material comes in contact with these surfaces, clean them with alcohol.

TROUBLES

Tape Runs Fast at Normal Record of Playback Speed -

1. Pressure roller may not be parallel with the capstan, causing the tape to climb out at the top.
   (a) Bend the pressure roller shaft until it is parallel with capstan (58).

2. Pressure roller cam and hub assembly (30) loose on the shaft of crank (44) resulting in the pressure roller (24) not contacting the capstan.
   (a) Turn the tape direction control to Stop.
   (b) Remove the top plate as described under "How to Remove Recorder from Carrying Case".
   (c) Center the recess of cam (30) to the stud of the arm and stud assembly (26).
   (d) Tighten the set screws of the pressure roller cam (30), leaving enough vertical end play of the shaft to prevent binding of parts.
   (e) Replace the top cover and knobs.

Tape Pressure Pads Do Not Move Away From The Recording Heads When Control (11) Is Turned To Stop -

1. Tension spring (20) broken or not properly connected.
   (a) Replace tension spring (20) as shown in Figure 2.

Failure to Record or Play Back -

1. Defective contacts in recording head control switch.
2. Head selector switch crank (109) bent or out of adjustment.
   (a) See (To Adjust The Centralized Tape Direction Control and Record Safety Switch Assembly - 5).

3. Defective Recording Head.

4. Check for broken leads to recording heads.

5. Listen-record crank (108) or coupling (113) out of adjustment causing incomplete switch movement.
   (a) See (To Adjust the Centralized Tape Direction Control and Record Safety Switch Assembly - 7 and 8).

6. Laminations on the recording heads dirty.
   (a) The laminations of the recording heads are subject to an accumulation of tape coating residue, which is worn off as the tape passes. This must be periodically removed since it will cause distortion or may cause failure to Erase or Record. This accumulation may be removed with alcohol and a small cotton swab on the end of a toothpick. Be careful not to mar the lamination as they should be smooth to operate properly.

Tape Fails to Move When Tape Direction Control Is Turned to Record or Playback Position -

1. Tension spring (82) broken or not connected. See Figure 2.
   (a) If this spring (82) is not connected to both bell crank assemblies (80 and 85) the idler's wheels (54) and (66) (depending on position of control (11) will not be pulled into engagement with the motor pulley and capstan-drum assembly (58). Thereby preventing the tape movement of the recording.

Tape Moves Past Recording Head But Fails To Wind On Take-Up Reel -

1. Tension springs (79) or (89) broken or not connected.
   (a) If these springs are not properly connected, the drum and wheel assemblies (70) and (87) will not be pulled to engage the motor pullys at the proper time. Thereby preventing the tape from being wound onto the take up reel.

To Adjust The Magic Eye Volume Level Indicator -

Apply a 1 volt signal from an audio oscillator to the phono input of the recorder. Connect a vacuum tube voltmeter to the output jack, and turn the output selector switch to position 2. Adjust the output of the oscillator and the volume control of the recorder so a 10.5 volt signal is indicated on the VTVM. Adjust the polentiometer (R2) so the shadow of the magic eye tube just closes this 10.5 volt signal level.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	26P1036	Mounting Screws-Plastic Cover	46	46P268	Compression Spring for Automatic Stops
2	46P148	Rear Plastic Cover "Web-Cor"			
3	49P147	Front Plastic Cover "Electronic' Memory"	47	11X698	Left Crank for Automatic Stop Lever
			48	41P854	Spacer
4	49P152	Record Level Bezel	49		Screw to Mount item 51
	28P009	Cork Liner for Level Eye (inserted in item 4)	50	41P814	Shoulder Washer-Special
			51	11X664	Cam Plate and Slide Assembly
5	11X646	Reel Cup	52	46P235	Tension Spring
	26P1030	Reel Cup Mounting Screw	53	25P046	Fibre Washer
6	39P066	Control Knob-Channel Selector	54	11X683	Idler Wheel
7	42P235	Wing Knob-Channel Selector	55	25P046	Fibre Washer
8	49P150	Channel Selector Bezel	56	11X647	Idler Mounting Arm
9		Cover Plate	57	25P370	Bakelite Washer
10	26P849	Cover Mounting Screw	58	11X650	Capstan and Drum Assembly
11	11X709	Shift Knob		41P802	Shaft for Capstan
	26P676	Set Screw for item 11	59	46P271	Tension Spring
12	42P237	"Record" Button	60	46P239	Compression Spring
	26P744	Set Screw for item 11	61	50P253	Retainer
13	39P067	Control Knob-Volume Control	62	11X660	Crank Arm-Left
14	11X708	Wing Knob and Shaft-Tone Control	63	11X659	Crank Arm-Right
15	49P151	Shift Knob Bezel	64	11X661	Speed Change Lever
16	49P149	Volume-Tone Bezel	65	11X647	Idler Mounting Arm
17	11X777	Erase Pole Arm and Pad-Right	66	11X683	Idler Wheel
	23P014	Felt Pad only for item 17 and 21	67	41P826	"Record" Push Rod
18	11X779	Voice Pole Arm and Pad-Right	68	50P224	Retainer Clip
	23P015	Felt Pad only for item 18 and 23	69	45P1067	Cam Plate Lever
	11X816	New Right Hand Pressure Pad Assembly	70	11X680	Drum and Wheel Assembly
			71	45P1065	Index Bracket
19	46P252	Tension Spring for item 18 and 23	72		Eccentric Adjusting Screw for item 74
20	46P145	Tension Spring for Erase Pole Arm			
21	11X778	Erase Pole Arm and Pad-Left	73	41P784	Eccentric Mounting Screw for item 74
	23P014	Felt Pad only for item 17 and 21			
22	26P1038	Head Mounting Screw	74	11X672	Arm and Roller Assembly
23	11X780	Voice Pole Arm and Pad-Left	75	46P236	Tension Spring for item 74
	23P015	Felt Pad only for items 18 and 23	76	11X657	Right Brake Actuating Lever
			77	46P248	Tension Spring for Brake Lever
	11X817	New Left Hand Pressure Pad Assembly	78	11X653	Right Brake Shoe Assembly
			79	46P273	Tension Spring Brake Shoe
24	11X673	Pressure Roller	80	11X655	Right Bell Crank Assembly
25	11X691	Recording Head-Left	81	11X665	Right Reel Arm
26	11X686	Arm and Stud for Pressure Roller	82	46P061	Tension Spring for items 80 and 85
27	46P161	Tension Spring-Heavy for item 26			
28	26P977	Adjusting Screw for Head Level	83	42X227	Speed Change Cam and Shaft
29	45P1069	Head Mounting Plate	84	11X662	Crank for Compensation Switch
30	11X687	Cam and Hub-Pressure Roller Actuating	85	11X656	Left Bell Crank Assembly
			86	11X666	Left Reel Arm
31	45P1158	Tape Guide Bracket	87	11X680	Drum and Wheel Assembly
32	11X692	Recording Head-Right	88	32P073	Automatic Shut Off Switch
33		Mounting Screw for item 35	89	46P273	Tension Spring Brake Shoe
34	49P167	Plastic Support for Tape	90	32P074	Motor Control Switch
35		Sub Mounting Plate	91	11X658	Left Brake Actuating Lever
36	46P017	Tension Spring -Light for item 26	92	46P248	Tension Spring for item 91
37	46P139	Tension Spring for item 36	93	11X654	Left Brake Shoe Assembly
38	11X667	Index Control Assembly	94		Motor Mounting Screw
39	45P1109	Retainer Washer	95		Flat Washer Motor Mounting
40	41P818	Control Shaft	96		Rubber Grommet Motor Mounting
41	46P237	Compression Spring	97		Spacer Motor Mounting
42	45P1064	Control Link	98		Flat Washer Motor Mounting
43	11X698	Right Crank and Automatic Stop Lever Assembly	99		Hex Nut Motor Mounting
			100	15X112	Motor-Left
44	11X695	Crank for item 30	101	15X113	Motor-Right
45		Pressure Roller and Pad Control	102	26P676	Set Screw

Ref. No.	Part No.	Description
103	11X669	Main Guide Crank
104	11X671	Record Control Lock
105	26P629	Set Screw
106	25P370	Bakelite Washer
107	46P238	Compression Spring
108	11X670	Crank- Record and Listen Switch
109	11X668	Crank - Rotary Head Selector Switch
110	11X681	Bracket for Rotary Switch
111	11X700	Crank and Link for Record and Listen Switch
112	45P1232	Plate Adjustable for 11X783
113	45P1057	Adjustable Lever
114	26P747	Screw for 45P1232
115	50P224	Retainer Clip
116	26P405	Adjusting Screws for 45P1057
117	11X783	Toggle for Record and Listen Switch Actuation
118	50P125	Retainer Clip
119	11X796	Roller and Bracket Record and Listen Switch Actuating
120	46P262	Tension Spring for 11X783 Toggle

ELECTRICAL PARTS LIST

Item No.	Use and Description
V1	6SC7 Mic. Amplifier 1st AF Amplifier
V2A	6SL7 2nd AF Amplifier Phase Inverter
V2B	6SC7 2nd AF Amplifier Phase Inverter
V3	6SN7GT 3rd AF Amplifier
V4	6K6GT Bias Oscillator
V5	6E5 Level Indicator
V6	6X5GT Rectifier
C1A	Filter ▫
C1B	Filter △
C2A	Decoupling ▫
C2B	Decoupling △
C2C	3rd AF Amp. Cathode, 40 mfd. @25 volts Electrolytic
C3	Audio Coupling, .01 mfd. @ 100 volts
C4	Tone Compensation, 75 mmf. @ 500 volts
C5	Tone Compensation, .001 mfd. @ 400 volts
C6	Tone Compensation, .047 mfd. @ 400 volts +
C7	Audio Coupling, .01 mfd. @ 400 volts
C8	Audio Coupling, .047 mfd. @ 400 volts +
C9	Tone Compensation, .005 mfd. @ 400 volts *
C10	Audio Coupling, .02 mfd. @ 600 volts
C11	Audio Coupling, .02 mfd. @ 600 volts
C12	Level Indicator, Filter, .0022 mfd. @ 600 volts #
C13	Level Indicator, Filter, .0022 mfd. @ 600 volts #
C14	Level Indicator, Grid, 1.0 mfd. @ 50 volts
C15	Fixed Trimmer, .006 mfd. @ 600 volts ‡
C16	Oscillator Feedback, .0022 mfd. @ 600 volts #
C17	Oscillator Cathode, .047 mfd. @ 400 volts +
C18	Tone Compensation, .02 mfd. @ 600 volts
C19	Tone Compensation, 2 mfd. @ 50 volts
C20	Line Filter, .015 mfd. @ 600 volts *
C21	Line Filter, .015 mfd. @ 600 volts *

+ Some Models use 05 mfd. @ 400 volts in this application

* Not used in all Models

Some Models use 002 mfd. @ 600 volts in this application

Item No.	Use and Description
	Note (Cont.)
	‡ Some Models use 0068 mfd. @ 600 volts in this application
R1A	Tone Control, 250K ohm, 1/2 watt, tapped @ 75K ohm
B	Volume Control, On-Off Switch, 250K ohm, 1/2 watt, tapped @ 75K ohm
R2A	Indicator Level Control 100K ohm, 1/2 watt
R3	Mike Input Shunt, 1 meg., 1/2 watt
R4	Mike Pre-Amp. Grid, 4.7 meg., 1/2 watt
R5	Mike Pre-Amp. Plate, 150K ohm, 1/2 watt
R6	Mike Pre-Amp. Decoupling, 1000 ohm 1/2 watt
R7	Tone Compensation, 4700 ohm, 1/2 watt
R8	Decoupling, 68K ohm, 1/2 watt
R9	1st AF Amp. Grid, 4.7 meg., 1/2 watt
R10	1st AF Amp. Plate, 150K ohm, 1/2 watt
R11	2nd AF Amp. Phase Inverter Cathode 1000 ohm, 1/2 watt
R12	2nd AF Amp. Plate, 470K ohm, 1/2 watt
R13	Phase Inverter Grid, 5100 ohm, 1/2 watt
R14	Phase Inverter Plate, 470K ohm, 1/2 watt
R15	3rd AF Amp. Grid, 220K ohm, 1/2 watt
R16	3rd AF Amp. Grid, 270K ohm, 1/2 watt
R17	Bias Oscillator Grid 33K ohm, 1/2 watt
R18	Voltage Dropping, 18K ohm, 1/2 watt
R19	Level Indicator Grid, 3.9 meg., 1/2 watt See Note 2
R20	Level Indicator Plate, 1 meg., 1/2 watt
R21	Tone Compensation, 39K ohm, 1/2 watt See Note 1
R22	Equalizing Network, 680 ohm, 1 watt
R23	Equalizing Network, 180 ohm, 1/2 watt
R24	Equalizing Network, 100 ohm, 1/2 watt
R25	Equalizing Network, 27 ohm, 1/2 watt Wire Wound
R26	Impedance Matching Network, 1.8 ohm, 1/2 watt Wire Wound
R27	Impedance Matching Network, 4.7 ohm, 1/2 watt Wire Wound
R28	Impedance Matching Network, 3.3 ohm, 2 watts Wire Wound
R29	Impedance Matching Network, 1.8 ohm, 1/2 watt Wire Wound
R30	Indicator Rectifier Diode Load 6800 ohm, 1/2 watt
R31	3rd AF Amp. Cathode, 820 ohm, 1/2 watt
R32	Filter, 2000 ohm, 5 watts Wire Wound
R33	Series Pilot Light, 15 ohm, 1/2 watt Wire Wound
R34	Voltage Dropping, 80 ohm, 1/2 watt Wire Wound
Note 1	Note Used in All Models
Note 2	Some Models Use 3.3 meg., Resistor in this application
T1	Power Transformer
T2	Audio Output
SP1	6" PM, 3.2 ohm Voice Coil (Speaker)
SP2	Cone (Part of SP1)
L1	Bias Oscillator
L2	RF Choke
M1	Fuse, 2 Amp. Type 3AG
M2	Dial Light #47
M3	Record-Playback Switch
M4	Output Switch
M5	Equalization Switch
M6	Crystal Diode 1N51

PHOTOFACT* Folder

ZENITH MODELS J2026R, J2027E, R, J2029E, R, J2030E, R, J2040E, J2042R, J2043R, J2044E, R, J2051E, J2053R, J2054R, J2055R, J2868R, J3069E

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MODEL J2027

ZENITH MODELS J2026R, J2027E, R, J2029E, R, J2030E, R, J2040E, J2042R, J2043R, J2044E, R, J2051E, J2053R, J2054R, J2055R, J2868R, J3069E

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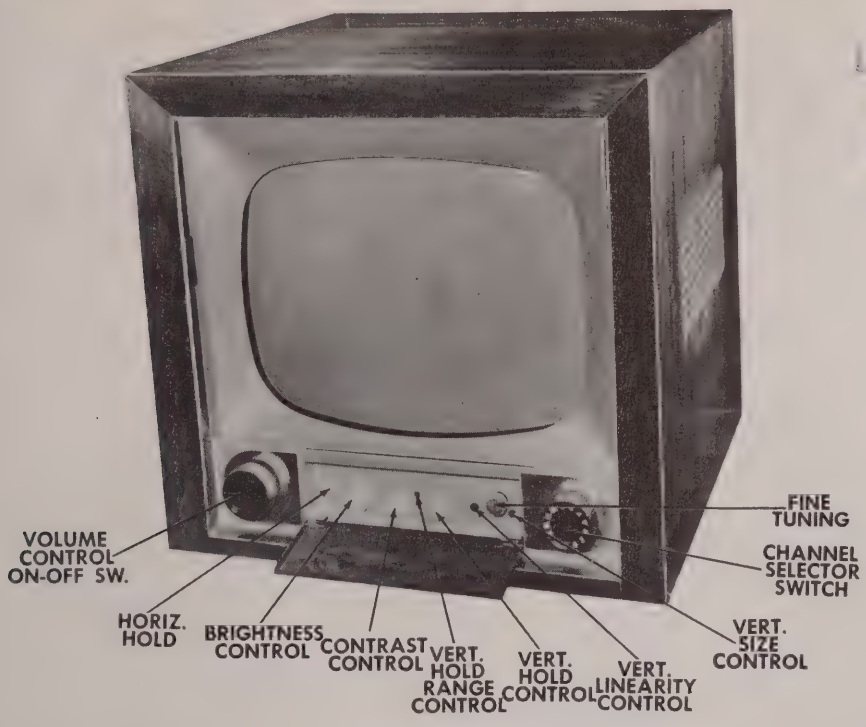

ZENITH MODEL J2027R

TRADE NAME	ZENITH	MODELS	TV CHASSIS	RADIO CHASSIS
		J2026R	20J22	
		J2027E, R, J2029E, R, J2030E, R, J2040E, J2042R, J2043R		
		J2044E, R,	20J21	
		J2051E, J2053R, J2054R, J2055R	20J22	
		J2126R	21J21	
		J2127E, R, J2129E, R, J2130E, R, J2140E, J2142R, J2143R, J2144E, R	21J20	
		J2151E, J2153R, J2154R		
		J2155R	21J21	
		J2868R	20J21	8H20Z
		J2968R	21J20	8H20Z
		J3069E	20J21	10H20Z
		J3169E	21J20	10H20Z
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.			
TYPE SET	Television Receiver			
TUBES	Twenty			
POWER SUPPLY	110-120 Volts AC-60 Cycle		RATING 2.0 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13			

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FOR SERVICE INFORMATION ON RADIO CHASSIS 10H20Z - SEE PHOTOFACT SET #151 - FOLDER 13

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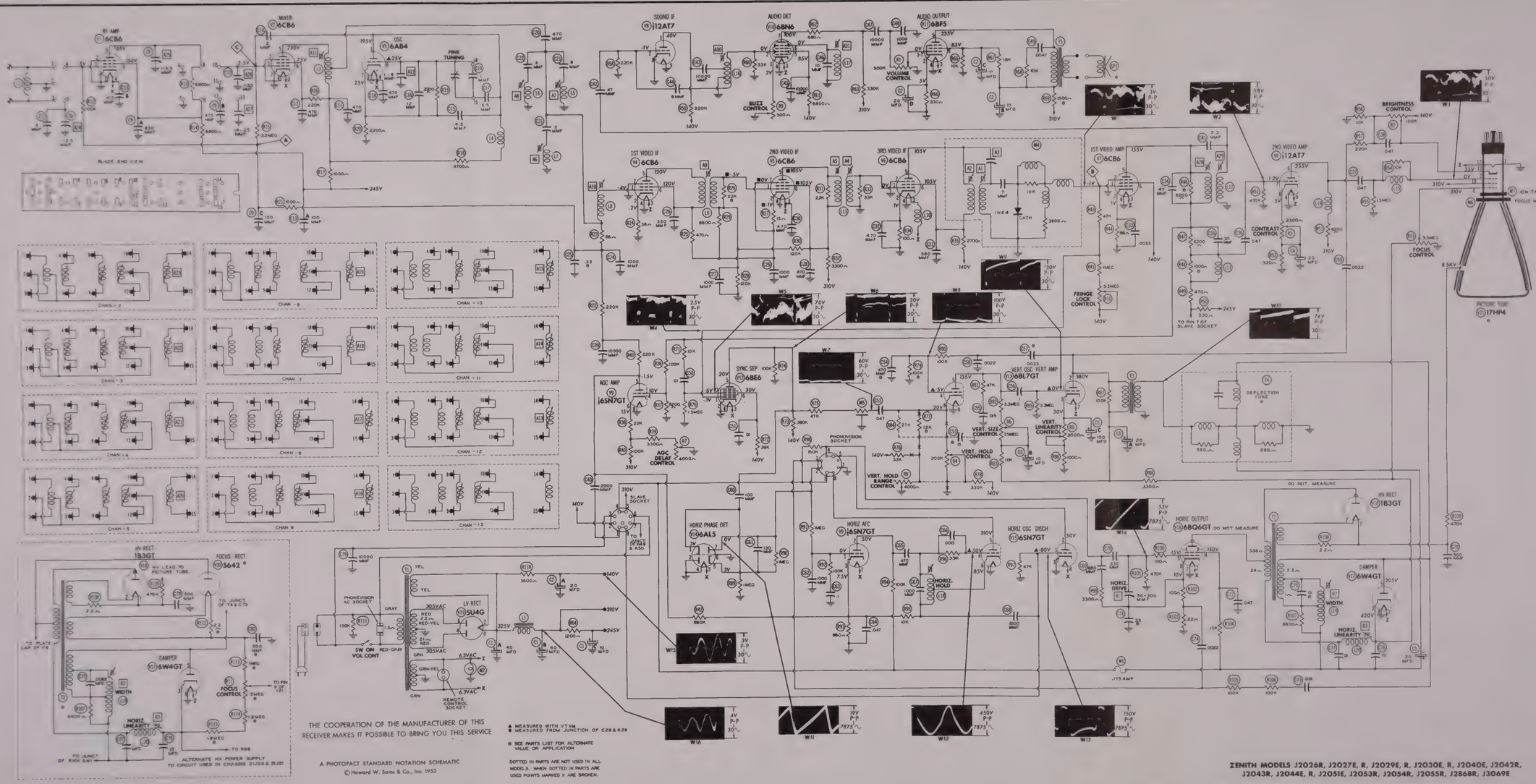

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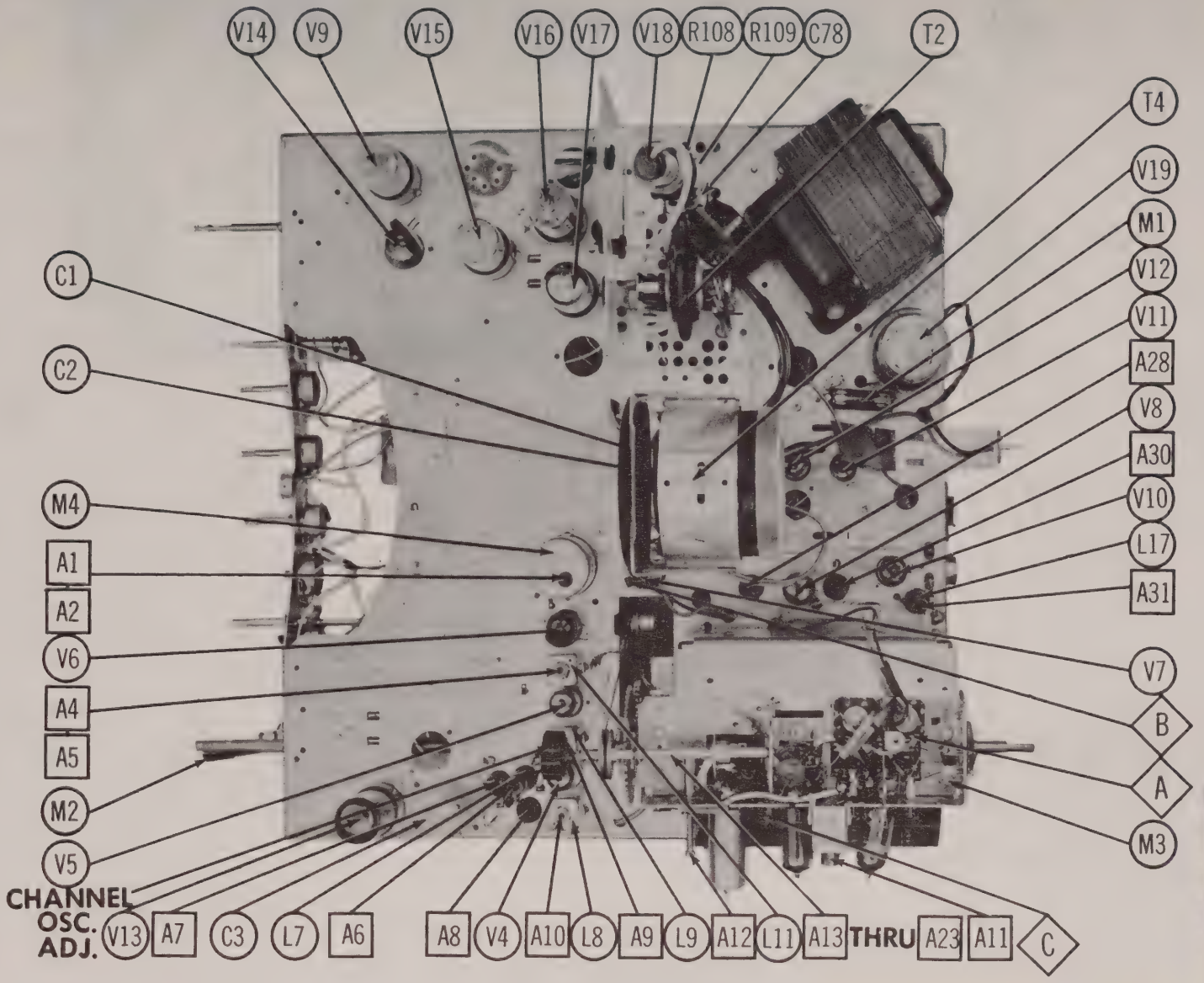
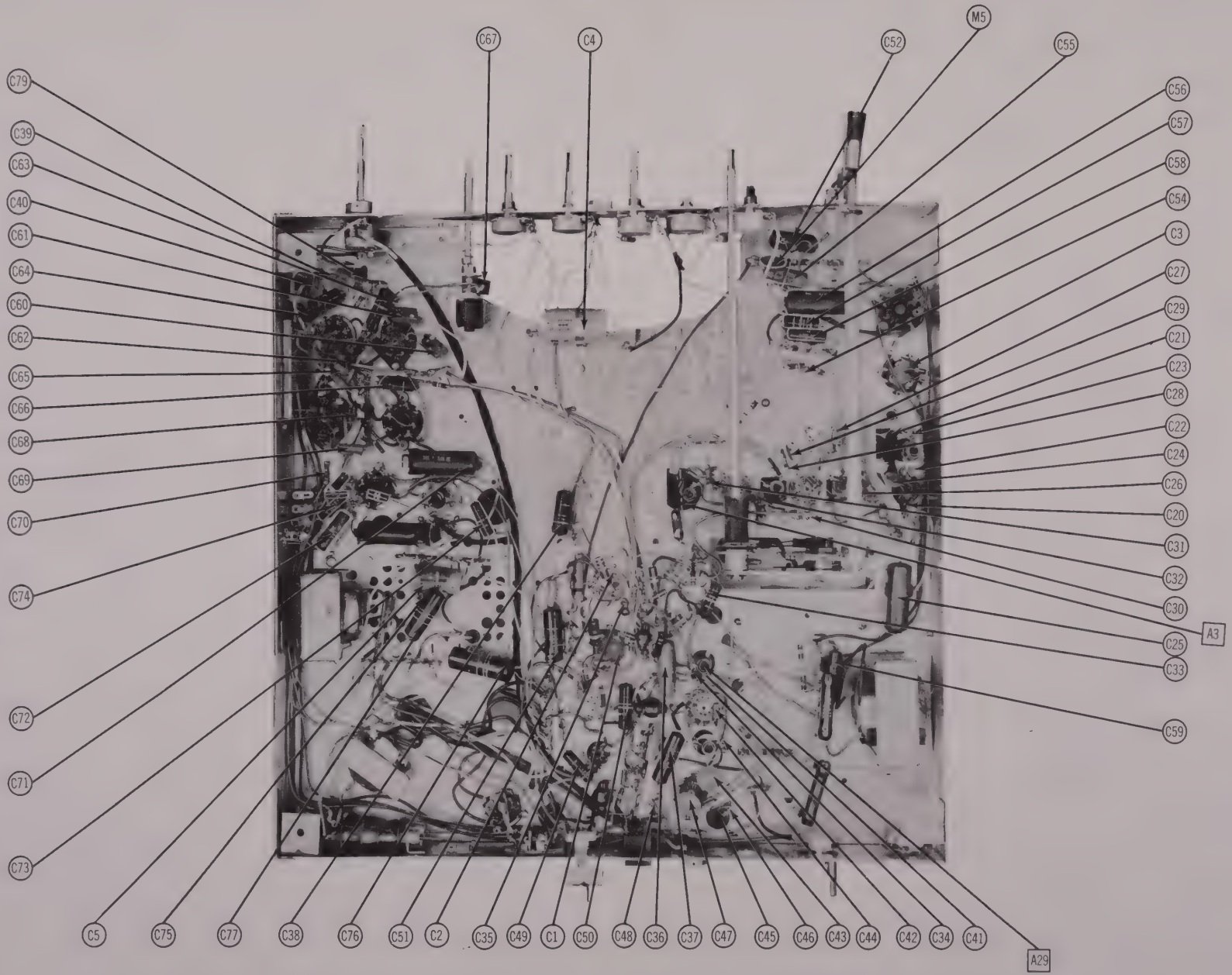


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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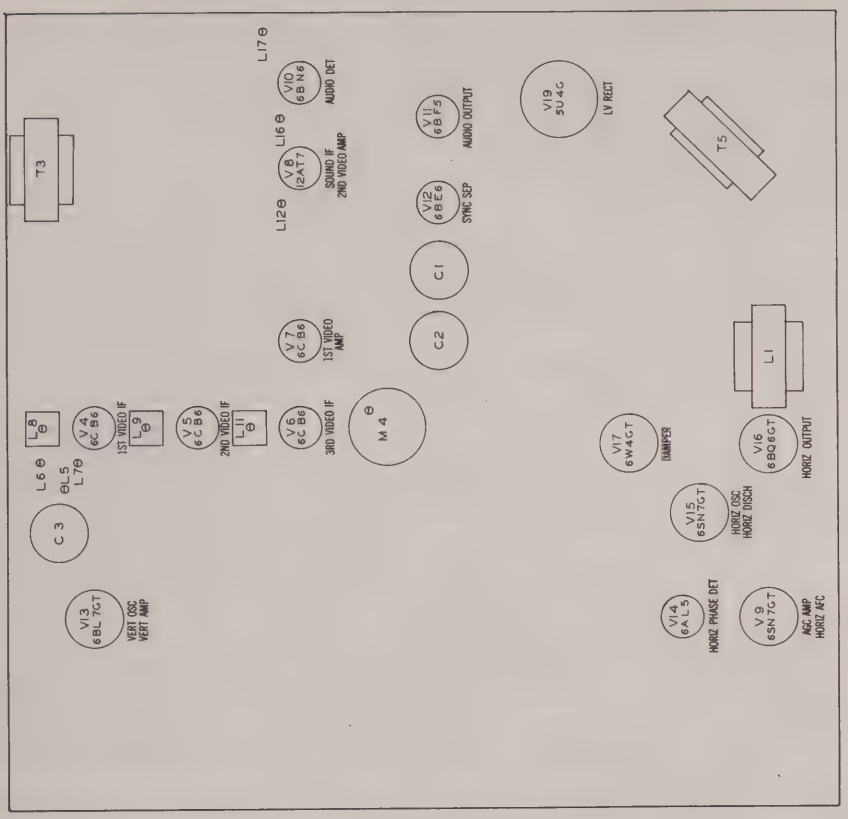
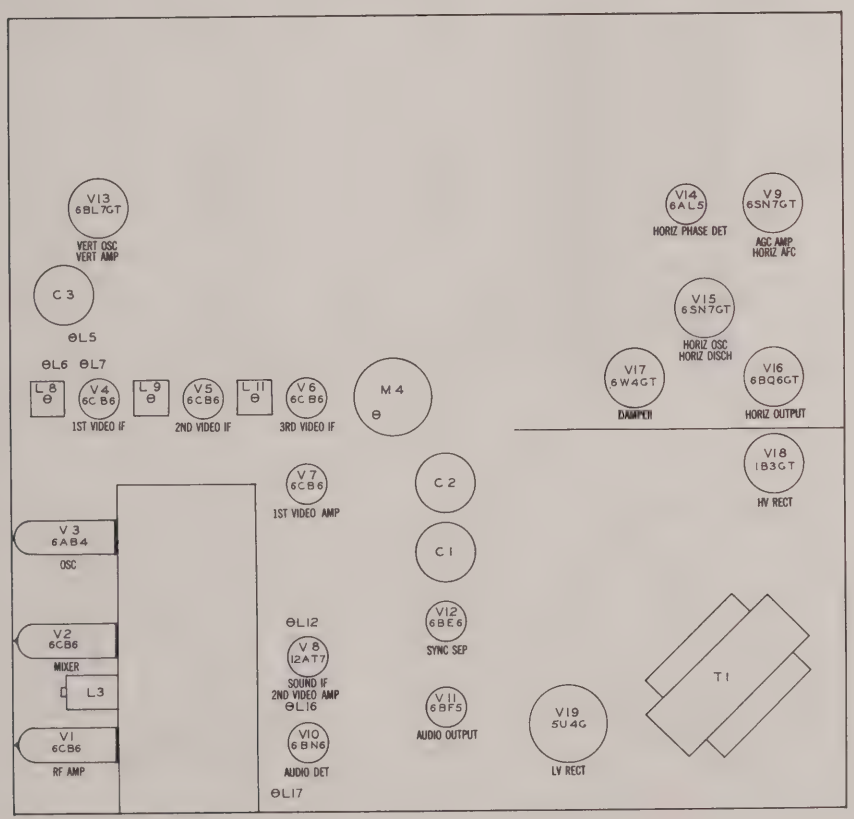


BOTTOM VIEW



TOP VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V15), from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator tube, (V3), from its socket to prevent the possibility of erroneous indications.
Connect the negative lead of a 6 volt battery to point (A), connect the positive lead to chassis.
Connnect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to Pin 1, (Grid) of 6CB6, (V6). Low side to chassis.	44MC (10MC swp.)	43.75MC	Any	Vert. amp. thru 10KΩ to Point (B). Low side to chassis.	A1, A2, A3	Adjust for maximum amplitude & symmetry as per Fig. 1. If proper response cannot be obtained check to make sure that the slugs are entering the coils from the outside ends. A3 is a coupling adjustment and should be adjusted for maximum band width.
2.	"	High-side to Pin 1, (Grid) of 6CB6, (V5). Low side to chassis.	"	"	"	"	A4, A5	Adjust for response curve similar to Fig. 2. If difficulty is encountered check the position of the slugs as in Step 1.
3.	"	High side to Point (C). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A6, A7 A8	Disconnect bias battery and ground Point A . Turn oscilloscope gain to maximum to obtain a response curve similar to Fig. 3. Adjust A6 for MINIMUM marker indication at 39.75MC point on response curve. Adjust A7 for MINIMUM 41.25MC marker and A8 for MINIMUM 47.25MC marker. Reconnect bias battery and reduce scope gain to normal.
4.	"	"	"	41.75MC	"	"	A9	Adjust to place 41.75MC marker at 50% on response curve.
5.	"	"	"	41.75MC 45MC 45.75MC	"	"	A10, A11	Adjust for response curve similar to Fig. 4. If necessary retouch A 1 thru A5 and A9 thru A11 for proper response.

OSCILLATOR ALIGNMENT

Replace the local oscillator tube in its socket.
The master oscillator adjustment A12 is used to adjust the oscillator frequency on channel 13 since the channel strip for channel 13 has no adjustment. This adjustment should not be adjusted for any other channel unless the channel strip adjustment proves inadequate, and it has been determined that the channel strip is not at fault.
The channel strip adjustments are made by pressing the oscillator adjust knob inward and turning it. Release the knob before turning the channel switch.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A12	Adjust to place markers as shown in fig. 5.
7.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A13	"
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

FIG.1

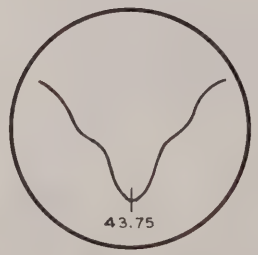


FIG.2

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

It is essential that the video IF alignment be correct before attempting RF alignment.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	69MC (10MC swp.)	67.25MC 71.75MC	4	Vert. amp. thru 10KΩ to Point Ⓑ. Low side to chassis.	A24, A25, A26	Adjust for maximum amplitude and symmetry of response curve.
9.	"	"	195MC (10MC swp.)	193.25MC 197.75MC	10	"	A27	Adjust for maximum amplitude of response curve.

SOUND IF ALIGNMENT

Connect an attenuator, (Zenith part No. S-17203 or equivilent), in series with the receiver antenna. Adjust the attenuator until the signal falls below the limiting level 6BN6 limiter detector as evidenced by a hiss similar to superregeneration.
Adjust the sound take-off transformer, (A28 and A29), the sound IF coil, (A30), and the quadrature coil, (A31), for maximum sound of best quality.
Adjust the buzz control, (R9), for minimum intercarrier buzz.
If during any of the above adjustments the signal rises above the limiting level of the detector, (hiss disappears) increase the signal attenuation until the hiss returns.
If the intercarrier buzz cannto be eliminated with the buzz control, check the AGC adjustment.

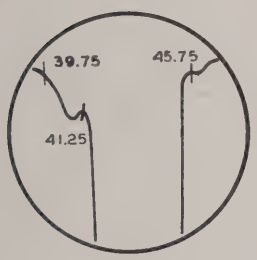


FIG.3

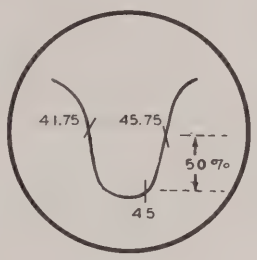


FIG.4

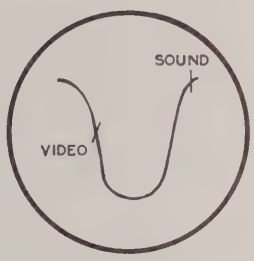
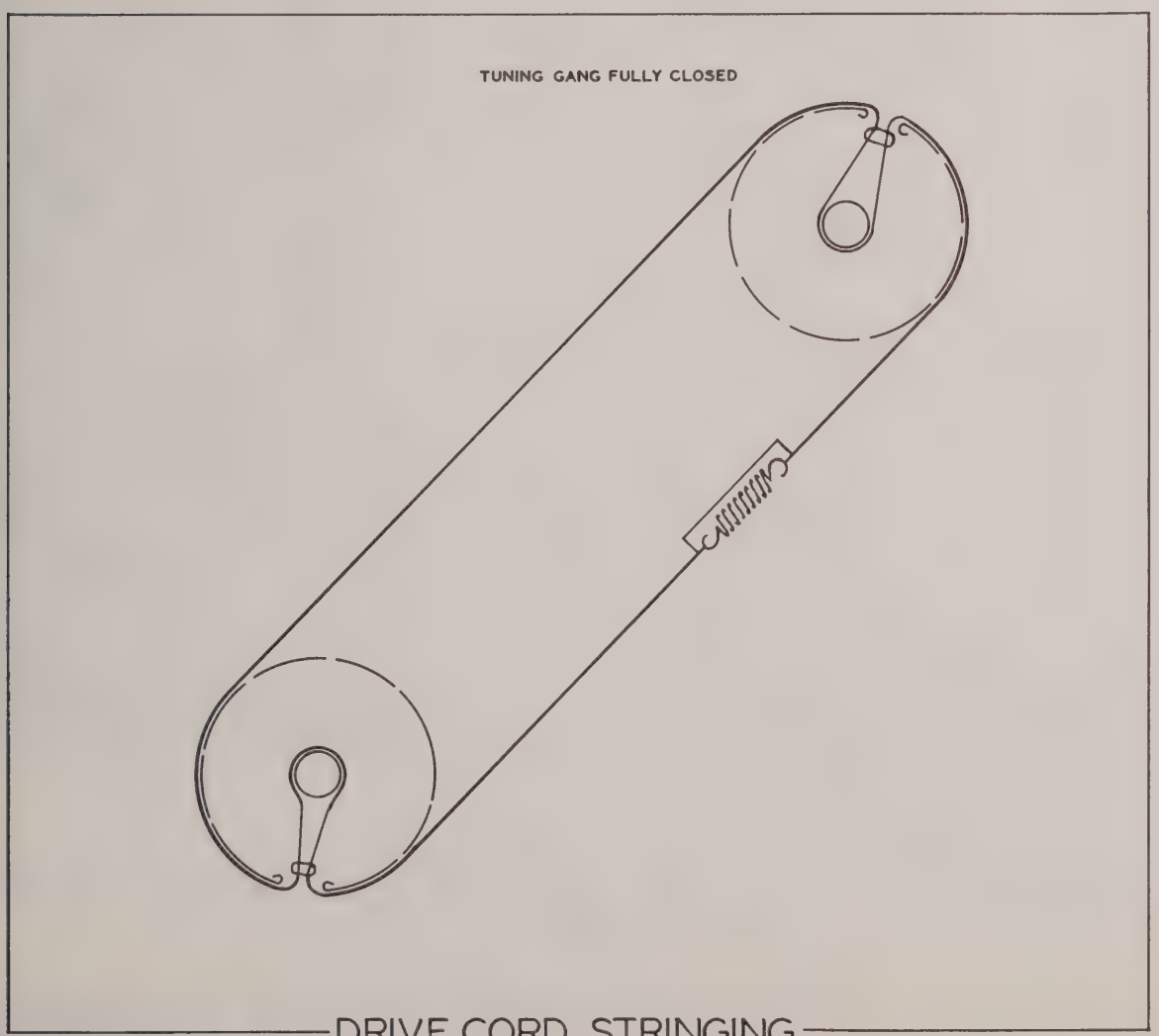


FIG.5



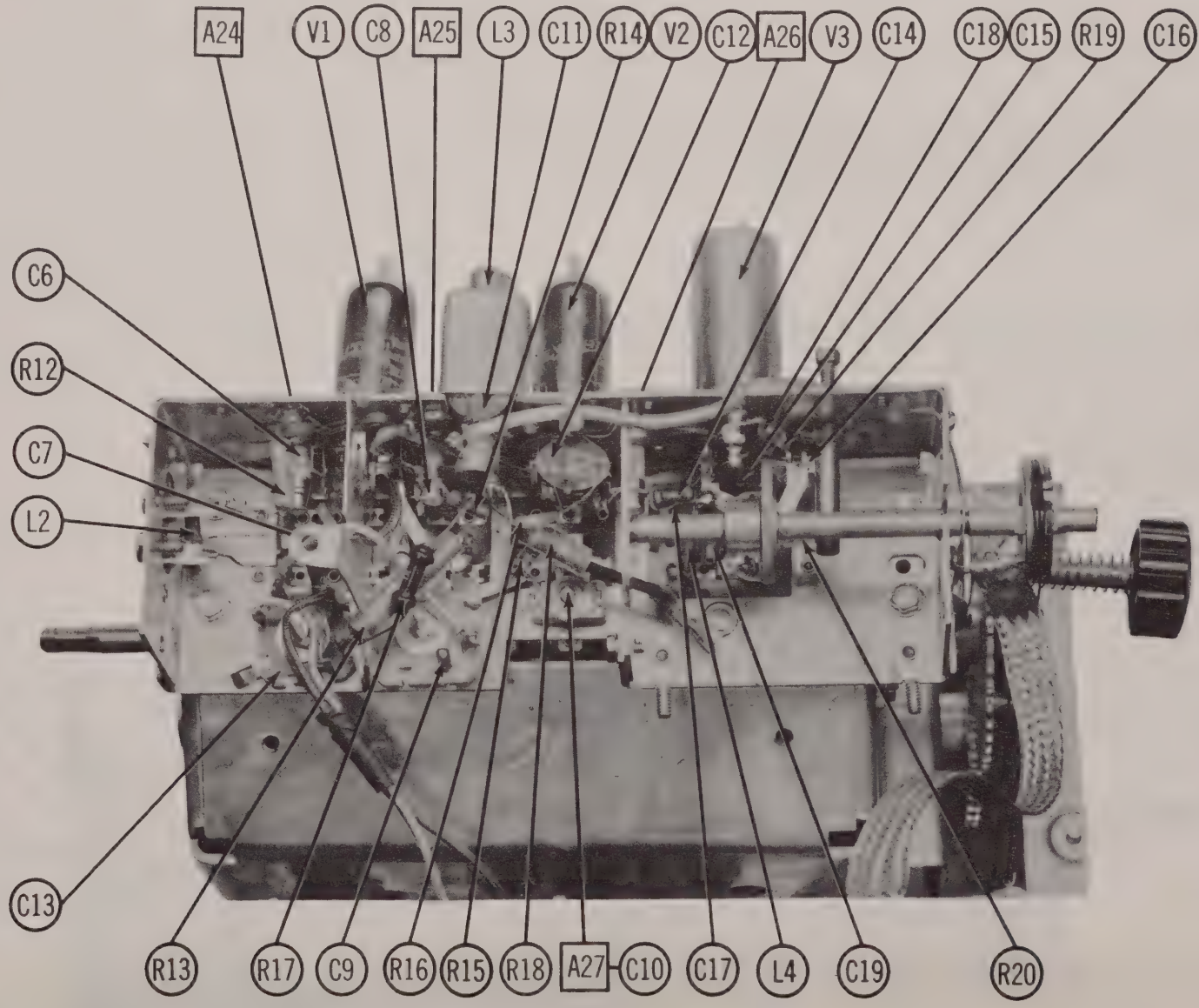
DRIVE CORD STRINGING

ZENITH MODELS J2026R, J2027E, R, J2029E, R, J2030E, R, J2040E, J2042R, J2043R, J2044E, R, J2051E, J2053R, J2054R, J2055R, J2868R, J3069E

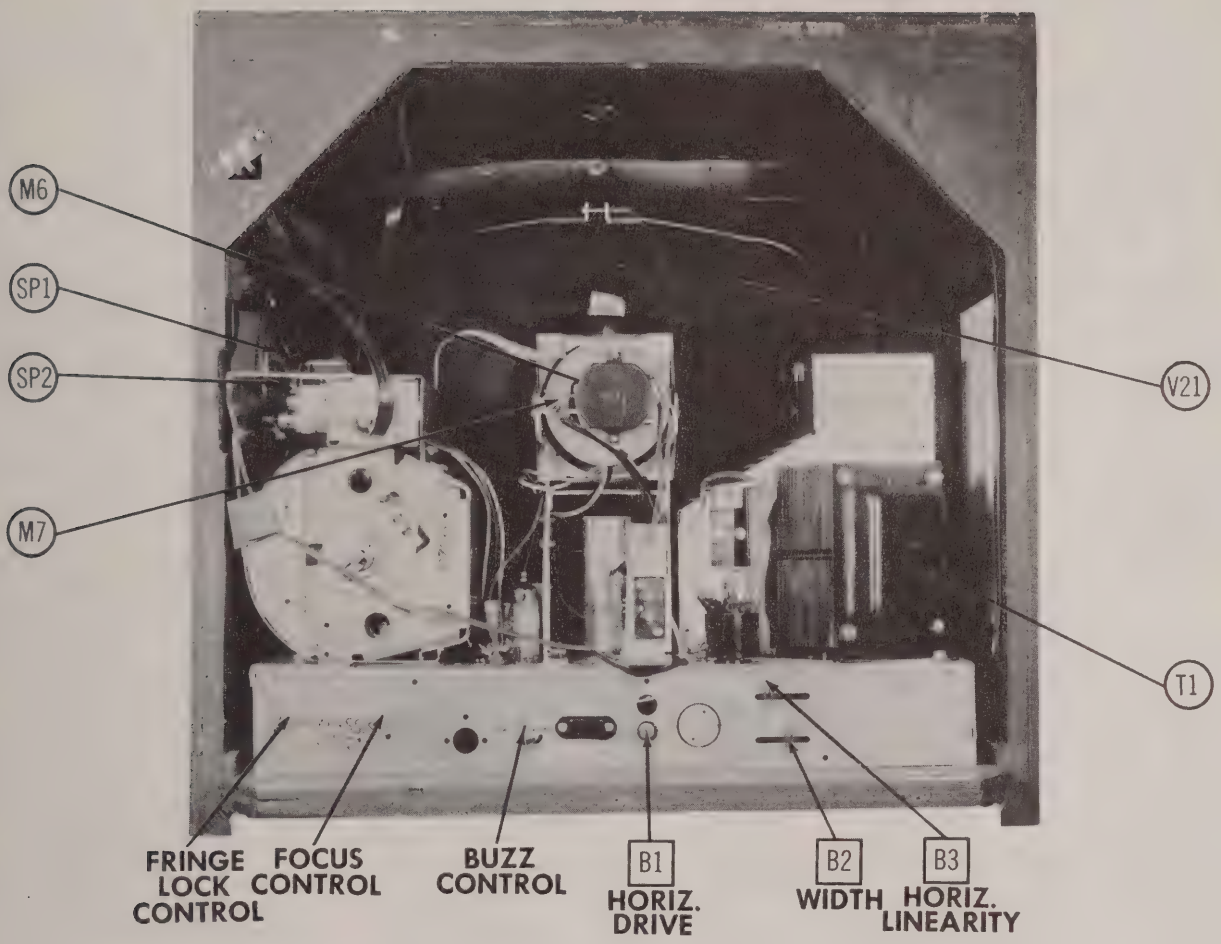
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.2Meg	0Ω	0Ω	.1Ω	†8.1KΩ	†8.1KΩ	0Ω		
V 2	6CB6	4.3Meg	0Ω	.1Ω	0Ω	†2.3KΩ	†220KΩ	0Ω		
V 3	6AB4	†7KΩ	4.4KΩ	0Ω	.1Ω	INF	4.4KΩ	2.2KΩ		
V 4	6CB6	1.1Meg	56Ω	.1Ω	0Ω	70KΩ	70KΩ	0Ω		
V 5	6CB6	60KΩ	70KΩ	.1Ω	0Ω	†3.4KΩ	†3.4KΩ	70KΩ		
V 6	6CB6	.1Ω	100Ω	.1Ω	0Ω	†8.2KΩ	†8.2KΩ	0Ω		
V 7	6CB6	3.9KΩ	68Ω	.1Ω	0Ω	†8.3KΩ	†5.5KΩ	0Ω		
V 8	12AT7	†225KΩ	220KΩ	0Ω	0Ω	0Ω	†8.3KΩ	470KΩ	1KΩ	.1Ω
V 9	6SN7GT	3Meg	†100KΩ	680Ω	8.2KΩ	680KΩ	25KΩ	.1Ω	0Ω	
V 10	6BN6	400Ω	4.7Ω	.1Ω	0Ω	†12.3KΩ	5Ω	†330KΩ		
V 11	6BF5	40KΩ	330Ω	.1Ω	0Ω	†2.4KΩ	†11KΩ	40KΩ		
V 12	6BE6	50KΩ	0Ω	.1Ω	0Ω	80KΩ	†44KΩ	1.5Meg		
V 13	6BL7GT	3.3Meg	#3.9KΩ	2.5KΩ	100KΩ	#5.1Meg	18KΩ	.1Ω	0Ω	
V 14	6AL5	1Meg	0Ω	.1Ω	0Ω	1Meg	0Ω	2Meg		
V 15	6SN7GT	47KΩ	†150KΩ	0Ω	44KΩ	†97Ω	11KΩ	0Ω	.1Ω	
V 16	6BQ6BT	INF	.1Ω	INF	†15KΩ	470KΩ	2Meg	0Ω	122Ω	Top Cap #34Ω
V 17	6W4GT	INF	2.2Meg	80KΩ	INF	†120Ω	2.1Meg	.1Ω	0Ω	
V 18	1B3GT	PINS 1-8	HAVE INF RESISTANCE							Top Cap #370Ω
V 19	5U4G	INF	10KΩ	INF	21Ω	INF	23Ω	INF	10KΩ	
V 20	17HP4	0Ω	1.5Meg	Pin 10 †97Ω	Pin11 18KΩ	Pin 12 .1Ω	1.3Meg			

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V19
# MEASURED FROM PIN 3 OF V17


A24
V1
C8
A25
L3
C11
R14
V2
C12
A26
V3
C14
C18
C15
R19
C16
C6
R12
C7
L2
C13
R13
R17
C9
R16
R15
R18
A27
C10
C17
L4
C19
R20

RF TUNER



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to synchronize the picture horizontally.
Adjust the horizontal drive trimmer, (B1), counter-clockwise until a bright vertical line appears in the picture. Then turn the trimmer clockwise just enough to remove the bright vertical line.
Adjust the width adjustment, (B2), until the picture is slightly wider than necessary to fill the mask.
Adjust the horizontal linearity adjustment until the picture is symmetrical from left to right.

AGC ADJUSTMENT

Connect a calibrated oscilloscope to alignment point ⓑ.
Tune in a strong TV station and adjust the AGC threshold control until a 2 volt peak signal is obtained on the oscilloscope screen.
If an oscilloscope is not available the AGC adjustment may be made as follows.
Turn the AGC control to fully clockwise.
Slowly turn the control counter-clockwise until the picture begins to distort and intercarrier buzz becomes apparent.
Back off the control clockwise to a point just below where the picture becomes stable and intercarrier buzz disappears. If the buzz remains check the buzz control.

FRINGE LOCK ADJUSTMENT

Turn the fringe lock control to fully clockwise and then 1/4 turn counter-clockwise. Check the operation of the synchronizing circuits by switching the tuner from channel to channel or off channel and back again. If the synchronizing circuits seem to be functioning normally leave the control at this setting. If not turn the fringe lock a few degrees counter-clockwise and readjust the hold controls. Repeat the check and slight change of the lock control until normal synchronization is obtained.
In noisy or weak signal areas, the fringe lock adjustment should be made for best sync. under the existing conditions.
Under these conditions it will be found that clockwise rotation of the control increases sync. stability.

DISASSEMBLY INSTRUCTIONS

1 - Remove 7 Control Knobs from front of cabinet.
2 - Remove Back Cover.
3 - Disconnect Built in Antenna.
4 - Disconnect Speaker.
5 - Remove two Clamps holding Speaker Leads.
6 - Remove two nuts holding Speaker. Remove Speaker.
7 - Remove four Chassis Bolts. Remove Chassis.
Note. For Picture Tube removal it is necessary to remove Chassis as outlined above .

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6CB6	6CB6	7CM	
V2	Mixer	6CB6	6CB6	7CM	
V3	Osc.	6AB4	6AB4	5CE	
V4	1st Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amp.	6CB6	6CB6	7CM	
V8	Sound IF Amp. Video Output	12AT7	12AT7	9A	
V9	Detector-AF Amp.	6BN6	6BN6	7DF	
V10	Audio Output	6BF5	6BF5	7BZ	
V11	AGC Amp.-Horiz. AFC	6SN7GT	6SN7GT	8BD	
V12	Sync. Seperator	6BE6	6BE6	7CH	
V13	Vert. Mult.-Vert. Amp.	6BL7GT	6BL7GT	8BD	
V14	Horiz. Phase Det.	6AL5	6AL5	6BT	
V15	Horiz. Osc.-Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rect.	1B3GT	1B3GT	3C	
V19	LV Rect.	5U4G	5U4G	5T	
V20	Focus Rect.	5642	5642		Chassis 21J20 and 21J21 only.

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: THOMAS PART No.	RMA BASE TYPE	NOTES
V21A	17HP4	17HP4		12D	
B	20HP4			12D	
C	17FP4	17FP4		12L	
D	20FP4			12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	22-2293	AFH 3-43		UPT44145		TVL-3785	▲ Filter
B	40	450							■ Filter
C	10	450							▲ Decoupling
C2A	20	400	22-2294	AFH 4-111		UPT111145		TVL-4708	▲ Filter
B	10	350				BR202A			■ Audio Output Plate
C	10	200							▲ Audio Output Screen
D	20	25							Audio Output Cathode
C3A	20	475	22-2292	AFH 3-157		UPT2150V10		TVL-3817	▲ Vert. Amp.Decoupling
B	10	475							■ Vert. Osc. Decoupling
C	100	50							▲ Vert. Amp. Cathode
C4	20	300	22-2225	PRS450/20		BR2035A		TVA-1608	Video Amp. Cathode
C5	20	25	22-1483C	PR825/25		BR202A		TVA-1205	Decoupling
C6	1-3.5		22-2093		829-4				Variable Trimmer
C7	5			SI5NP0			NP0K-050		Fixed Trimmer
C8	1-3.5		22-2093		829-4				Variable Trimmer
C9A	630								RF Amp. Screen
B	475								Fixed Trimmer
C	100			SI100	D6-101		GP1K-101	5GA-T1	AGC Filter
C10	1-3.5		22-2093		829-4				Variable Trimmer
C11	470		22-6	BPD-00047	DD-471		GP2K-471	5GA-T47	Mixer Plate Decoupling
C12	470		22-6	BPD-00047	DD-471		GP2K-471	5GA-T47	Mixer Screen Bypass
C13A	100			SI100	D6-101		GP1K-101	5GA-T1	RF Bypass
B	100			SI100	D6-101		GP1K-101	5GA-T1	Fil. Bypass
C14	2		22-2131				N150K-020		Osc. Coupling
C15	4.5		22-2300						Fixed Trimmer
C16	12		22-1950				N080-331-120		Osc. Grid Cap.
C17	5.5		22-2314				N330K-5R5		Osc. Feedback
C18	470		22-2143	SI470	D6-471		GP2K-471	5GA-T47	Osc. Fil.
C19	1		22-2313				N750K-010		Fixed Trimmer
C20	470		22-2143	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	IF Coupling
C21	5		22-2050	SI5NP0			NP0K-050		Fixed Padder
C22	6		22-2051				NP0K-060		Fixed Padder
C23	6		22-2051				NP0K-060		Fixed Padder
C24	1000		22-7	BPD-001	DD-102	1W5D1	801-001	5HK-D1	AGC Filter
C25	.33	200		P288-33					AGC Filter †
C26	330		22-2309	SI330	D6-331		GP2K-331	5GA-T33	1st.Video IF Dec.
C27	1000		22-7	BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd. Video IF Grid Dec.
C28	470		22-2143	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	2nd. Video IF Dec.
C29	1000		22-7	BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd. Video IF Cathode
C30	470		22-2143	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	2nd. Video IF Fil.
C31	560		22-2310	SI560	D6-561	1W5T6	GP2K-561		3rd Video IF Dec.
C32	470		22-2143	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	3rd Video IF Cathode
C33	.0033	600	22-2248	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D33	1st Video Amp. Cathode
C34	47		22-1876	SI47N080			N080-338-470		Fixed Trimmer
C35	30		22-2297	SI30		5W5Q3	GP1K-300		Video Coupling
C36	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C37	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C38	.047	400	22-1775	P488-047	DF-503	PTE4S5		4TM-S47	Picture Tube Cathode
C39	10000		22-3	BPD-01	DD-103	1D3S1	821-01	5HK-S1	AGC Filter
C40	2000		22-8	BPD-002	DD-202	1W5D2	801-002	5HK-D2	AGC Amp. Plate
C41	3.3		22-2343	SI3.3NP0	TCZ-3.3		NP0K-3R3		Sound IF Coupling
C42	47		22-1876	SI47N080			N080-338-470		Sound IF Coupling
C43	10000		22-3	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Sound IF Cpupling
C44	6		22-1869				N080-331-060		Neutralizing Cap.
C45	10000		22-3	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Accelerating Anode
C46	10		22-1895	SI10	D6-100	5W5Q1	GP1K-100	5GA-Q1	Fixed Trimmer
C47	10000		22-3	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Audio Coupling
C48	1000		22-2218	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Tone Comp.
C49	.0047	600	22-1782	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Output Plate
C50	.01	600	22-1843	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling
C51	.1	400	22-2081	P488-1	DF-104	PTE4P1		4TM-P1	Sync. Clipper Screen
C52	.047	400	22-1775	P488-047	DF-503	PTE4S5		4TM-S47	Vert. Sync. Coupling
C53	.15	200	22-2166	P288-15				2TM-P15	Vert. Osc. Cathode *
C54	470		22-2143	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	Vert. Osc. Grid †
C55	.015	600	22-2264	P688-015				6TM-S15	Vert. Discharge
C56	.1	600	22-1841	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C57	.0033	600	22-2248	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D33	Vert. Feedback ¶
C58	.0022	600	22-1814	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Voltage Divider
C59	.0022	600	22-1845	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Vert. Feedback
C60	100	500	22-365	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. Sync. Coupling
C61	130	500	22-2162	1469-00015		5R5T15			Horiz. Feedback
C62	1000		22-2112					2TM-P1	AFC Filter
C63	.1	200	22-1777	P288-1	DF-104	PTE4P1		2TM-S47	AFC Filter
C64	.047	200	22-1778	P288-047	DF-503	PTE4S5		4TM-S47	AFC Filter
C65	470	500	22-1138	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	AFC Coupling
C66	.0015	400	22-1785	P688-0015	D6-152		GP2L-152	6TM-D15	Horiz. Osc. Grid
C67	1000	500	22-2163	1464-001		1R5D1		MS-21	Fixed Trimmer
C68	1000		22-7	BPD-001	DD-102	1W5D1	801-001	5HK-D1	Horiz. Sweep Coupling
C69	680	500	22-2125	1479-0007		2R5T7		MS-37	Horiz. Discharge
C70	330		22-2309	SI330	D6-331		GP2K-331	5GA-T33	Horiz. Sweep Coupling
C71	.33	200		P288-33					Horiz. Output Cathode †
C72	.047	400	22-1775	P488-047	DF-503	PTE4S5		4TM-S47	Horiz. Output Screen
C73	.001	600	22-2128	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Feedback
C74	.0022	600	22-1814	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Horiz. Feedback
C75	.01	600	22-1843	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer #
C76	.15	400	22-2341	P488-15				4TM-P15	Damper Filter
C77	.01	400	22-2340	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Damper Filter
C78	500	20000	22-1832	HV20C	TV3-502				HV Filter
C79	10000		22-3	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Line Filter
C80	5000	6000	22-2322	6084-0005		PTE80T5		TVM-356	Focus Rect. Filter † †

* Not used in all Models
† Some Models use .47MFD in this application (Part No. 22-2145)
‡ Some Models use 1200MMF in this application (Part No. 22-1880)
¶ Some Models use 1000MMF in this application (Part No. 22-2128)
# Some Models use .0082 in this application (Part No. 22-2327)
† † Used in chassis 21J20 and 21J21 only.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	63-2125	Q13-133	AG-60-Z	AN-60	Volume Control & Switch
B	Shaft			Switch	KS8-3	AK-4	Attach to R1A per instructions
C	Switch			76-1	SWB	K-155	Attach to R1A per instructions
R2A	100KΩ	½	63-2126	Q11-128	AG-49-8	SWB-220	Brightness Control
B	Shaft		Not Req.	Not req.	KS8-3	Not req.	Attach to R2A per instructions
R3A	2500Ω	½	63-2346		AG-15-8	SB-226	Contrast Control
B	Shaft		Not Req.		KS8-3	Not req.	Attach to R3A per instructions
R4A	200KΩ	½	63-2127	Q11-130	AG-52-8	SB-221	Vertical Hold Control
B	Shaft		Not Req.	Not req.	KS8-3	Not req.	Attach to R4A per instructions
R5A	2000Ω	½	63-2172	Q11-110	AM-11-8	AN-6	Vertical Linearity Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	7.5Meg	½	63-2351	Q11-143	AM-86-8	SB-227	Vertical Size Control
B	Shaft		Not Req.	RQ	FKS-1/4	Not req.	Attach to R6A per instructions
R7	4000Ω	1	63-2159				AGC Delay Control - Wire Wound
R8	4000Ω	1	63-2159				Vertical Hold Range Control - Wire Wound
R9	500Ω	1	63-2050	W-500	43-500		Buz Control - Wire Wound
R10A	5.5Meg	1	63-2351	Q11-141	AG-85-8	SB-227	Fringe Lock Control
B	Shaft		Not req.	RQ	FKS 1/4	Not Req.	Attach to R10A per instructions
R11A	5.5Meg	1	63-2351	Q11-141	AG-85-8	SB-227	Focus Control #
B	Shaft		Not req.	RQ	FKS 1/4	Not Req.	Attach to R11A per instructions

Chassis 21J20 and 21J21 use 15Meg Control Pt# 63-2369

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R12	100KΩ	½	63-1869	BTS-100 K	RF Amplifier Grid
R13	6800Ω	2	63-1571	BTB-6800	RF Amplifier Plate
R14	6800Ω	½	63-1820	BTS-6800	RF Amplifier Decoupling
R15	3.3Meg	½	63-1933	BTS-3.3Meg	Mixer Grid
R16	220KΩ	½	63-1883	BTS-220K	Mixer Screen
R17	1000Ω	1	63-1785	BTA-1000	Decoupling
R18	4700Ω	1	63-943	BTA-4700	Mixer Plate
R19	2200Ω	½	63-1799	BTS-2200	Oscillator Grid
R20	2200Ω	½	63-1799	BTS-2200	Oscillator Cathode
R21	1000Ω	½	63-1785	BTS-1000	AGC Network
R22	220KΩ	½	63-1883	BTS-220K	AGC Network
R23	68Ω	½	63-1737		AGC Network
R24	56Ω	½			1st. Video IF Amplifier Cathode
R25	470Ω	½	63-1771	BTS-470K	1st. Video IF Amplifier Decoupling
R26	22KΩ	½	63-1841	BTS-22K	2nd. Video IF Transformer Shunt - See Note 1
R27	15Ω	½			2nd. Video IF Amplifier Cathode
R28	120KΩ	½		BTS-120K	Voltage Divider
R29	6800Ω	2	63-1571	BTB-6800	Bias Network
R30	120KΩ	½		BTS-120K	Voltage Divider
R31	22KΩ	½	63-1841	BTS-22K	3rd.Video IF Amplifier Primary Coil Shunt
R32	3300Ω	½	63-1807	BTS-3300	2nd. Video IF Amplifier Decoupling
R33	33KΩ	1	63-957	BTA-33K	3rd. Video IF Amplifier Transformer Secondary Coil Shunt
R34	100Ω 20%	½	63-1744	BTS-100	3rd. Video IF Amplifier Cathode
R35	2700Ω	1		BTA-2700	3rd. Video IF Amplifier Decoupling.
R36	100KΩ	1	63-1870	BTA-100K	AGC Network
R37	8200Ω	½	63-1824	BTS-8200	Keyed AGC Grid
R38	22KΩ	½	63-1841	BTS-22K	Keyed AGC Cathode
R39	3300Ω	½	63-1807	BTS-3300	Voltage Divider
R40	100KΩ	1	63-1869	BTA-100K	Voltage Divider
R41	220KΩ 20%	½	63-1884	BTS-220K	Keyed AGC Plate
R42	680KΩ 20%	½	63-1905	BTS-680K	AGC Network
R43	47KΩ	½	63-1855	BTS-47K	Video Amplifier Grid
R44	68Ω	½	63-1736		Video Amplifier Cathode
R45	1Meg	½	63-1911	BTS-1Meg	Voltage Divider
R46	8200Ω	½	63-1824	BTS-8200	Sound Take-Off Coil Shunt - See Note 2
R47	8200Ω 5%	2	63-1579	BTB-8200 5%	1st. Video Amplifier Plate
R48	1000Ω	½	63-1785	BTS-1000	Video Peaking Coil Shunt - See Note 3
R49	470Ω 5%	½	63-1770	BTS-470 5%	Video Amplifier Plate
R50	330Ω 5%	½	63-1763	BTS-330 5%	Video Amplifier Plate
R51	470KΩ	½	63-1897	BTS-470K	2nd. Video Amplifier Grid
R52	330Ω	½	63-1764	BTS-330	Voltage Divider
R53	8200Ω	1	63-1824	BTA-8200	2nd Video Amplifier Plate
R54	10KΩ	½	63-1827	BTS-10K	Video Peaking Coil Shunt

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R55	1.5Meg 20%	½	63-1919	BTS-1.5Meg	Picture Tube Grid
R56	10KΩ 20%	½	63-1828	BTS-10K	Voltage Divider
R57	220KΩ	½	63-1883	BTS-220K	Vertical Retrace Blanking Network
R58	220KΩ	½	63-1883	BTS-220K	Sound IF Amplifier Grid
R59	220KΩ	½	63-1883	BTS-220K	Sound IF Amplifier Plate
R60	33KΩ	½	63-1849	BTS-33K	Detector Grid
R61	6800 20%	2	63-2334	BTB-6800	Detector Screen
R62	680Ω	½	63-1778	BTS-680	Detector Plate
R63	330KΩ	½	63-1890	BTS-330K	AF Amplifier Plate
R64	1200Ω	10	63-2390	1 3/4A-1500	Voltage Divider- Wire Wound
R65	10KΩ	2	63-1198	BTB-10K	Voltage Divider
R66	330Ω	½	63-1794	BTS-330	Output Cathode
R67	18KΩ	2	63-2364	BTB-18K	Output Screen
R68	10KΩ	½	63-1827	BTS-10K	Damping
R69	1500Ω	2	63-2294	BTB-1500	Output Decoupling-Wire Wound See note 4.
R70	1.5Meg	½	63-1918	BTS-1.5Meg	Sync. Clipper Grid
R71	10KΩ 20%	½	63-1828	BTS-10K	AGC Network
R72	39KΩ	½	63-1852	BTS-39K	Sync. Clipper Screen Dropping
R73	390KΩ	½	63-1894	BTS-390K	Sync. Clipper Plate
R74	100K	½	63-1869	BTS-100K	Voltage Divider
R75	47KΩ	½	63-1855	BTS-47K	Integrator Network
R76	33KΩ	½	63-1848	BTS-33K	Bias Network
R77	15KΩ	½	63-1834	BTS-15K	Vertical Oscillator Cathode See note 5.
R78	330KΩ	½	63-1890	BTS-330K	Bias Network See Note 5.
R79	100KΩ	½	63-1869	BTS-100K	Vertical Oscillator Grid See note 6
R80	100KΩ	½	63-1869	BTS-100K	Vertical Feedback
R81	47KΩ	½	63-1855	BTS-47K	Vertical Peaking
R82	3.3.Meg 20%	½	63-1933	BTS-3.3Meg	Vertical Oscillator Plate
R83	10KΩ	½	63-1827	BTS-10K	Vertical Oscillator Decoupling
R84	27KΩ	½	63-1845	BTS-27K	Vertical Oscillator Cathode
R85	3.3Meg 20%	½	63-1933	BTS-3.3Meg	Vertical Amplifier Grid
R86	1000Ω	½	63-1785	BTS-1000	Voltage Divider
R87	100KΩ	½	63-1869	BTS-100K	Vertical Output Transformer Shunt
R88	3300Ω	10	63-3121	1 3/4A-3500	Decoupling Wire-Wound
R89	1Meg	½	63-1911	BTS-1Meg	Horizontal Phase Detector Diode Load
R90	1Meg	½	63-1911	BTS-1Meg	Horizontal Phase Detector Diode Load
R91	1Meg	½	63-1911	BTS- 1Meg	Horizontal AFC Filter
R92	100KΩ 20%	½	63-1870	BTS-100K	Horizontal AFC Filter
R93	680Ω	½	63-1778	BTS-680	Horizontal AFC Cathode
R94	100KΩ	2	63-1963	BTB-100K	Horizontal AFC Plate
R95	10KΩ	2	63-1198	BTB-10K	Bias Network
R96	33KΩ	½	63-1848	BTS-33K	Horizontal Oscillator Grid
R97	47KΩ	½	63-1855	BTS-47K	Horizontal Discharge Grid
R98	150KΩ	½	63-1876	BTS-150K	Horizontal Discharge Plate
R99	3300	½	63-1806	BTS-3300	Horizontal Peaking
R100	100Ω 20%	½	63-1744	BTS-100	Parasitic Suppressor
R101	470KΩ	½	63-1897	BTS-470K	Horizontal Output Grid
R102	100Ω 20%	½	63-1744	BTS-100	Horizontal Output Cathode - Wire Wound
R103	22Ω	½	63-1715		Horizontal Output Cathode
R104	15KΩ	20	63-3102	2D-15K	Horizontal Output Screen Wire Wound
R105	100KΩ	2		BTB-100K	Horizontal Feedback
R106	100KΩ	2		BTB-100K	Horizontal Feedback
R107	6800Ω	1		BTA-6800	Width Coil Shunt
R108	2.2Ω	½	63-2114		High Voltage Rectifier Filament - Wire Wound
R109	470KΩ	½	63-1897	BTS-470K	High Voltage Filter
R110	5500Ω	10	63-2021	1 3/4A-6000	Filter Wire Wound
R111	100KΩ	½	63-1869	BTS-100K	Line Isolation
R112	2.2Ω	½	63-2114		Focus Rect. Fil. Dropping - See Note 7
R113	1Meg	½	63-1911	BTS-1Meg	Voltage Divider - See Note 7
R114	1.8Meg	1	63-2378	BTA-1.8Meg	Voltage Divider - See Note 7
R115	1.8Meg	1	63-2378	BTA-1.8Meg	Voltage Divider - See Note 7

Note 1 Some Models may use a 39KΩ Resistor in this application
Note 2 Some Models may use a 12KΩ Resistor in this application
Note 3 Some Models may use a 2200Ω Resistor in this application
Note 4 Alternate Part Number 63-2321.
Note 5 Not used in all Models
Note 6 Some Models may use a 330KΩ Resistor in this application
Note 7 Used in Chassis 21J20 and 21J21 only.

• TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC	640VCT	5VAC	12.6VCT	95-1277			
	②2.0A	②.270A	③3A	5.2A				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2A	360Ω	4.3Ω Tapped ②10	S-18537	A-8130	HV0-7		Horizontal Output
*	Tapped ②24Ω	SEC.2 0Ω					
B			S-18125 ④				
T3	610Ω	12Ω	95-1275	A-8112①	A-3036 ①	TS0-5 ①	Vertical Output
T4A	17Ω		95-1263⑤	DY-8	MDF-70		Horiz. Deflection Coils
B	51Ω						Vert. Deflection Coils

① Drill One New Mounting Hole
④ Used in Chassis 21J20 and 21J21 only.
⑤ Some Models may use Pt.#95J292

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T5	9KΩ	3.2Ω	880Ω	.5Ω	95-1274	A-3823	A-3020	RO-16	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD RES.	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.2Ω	49-696	ST-803 Mod. P525-V	52A1	② Used in Models J2040E, J2042R, J2043R, J2044E, J2044R, J2051E, J2053R, J2054R, J2055R, J2140E, J2142R, J2143R, J2144E, R, J2151E, J2153R, J2154R and J2155R.
B	PM		49-649 ②	ST-119 Mod. P10-T	10A4A	
C	PM		49-704 ③		12A4A	③ Used in Models J2868R, J3069E, J2968R & J3169E.
	CONE DIA.	V. C. DIA.				
SP2A	5 1/8"	9/16"	ZC 5093			
B	10"		ZC 10161			
C	12"		ZC 1216F			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.225A	97Ω	3 Henries	95-1280		C-2994①		① Drill One New Mounting Hole

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ZENITH PART No.	MERIT PART No.	
L2	Ant. Coil	0Ω		S-17173		
L3	Conv. Plate Coil	.2Ω		S-17970		Tap at .1Ω
L4	RF Choke	.2Ω		S-18020		
L5	Sound Trap	.1Ω		S-18209		
L6	Adj. Sound Trap	.1Ω		S-18210		
L7	Adj. Video Trap	.1Ω		S-18211		
L8	lst. Video IF	.1Ω		S-17906		
L9	2nd. Video IF	.1Ω	.1Ω	S-17907		
L10	Fil. Choke	.1Ω		S-16984		
L11	3rd. Video IF	.1Ω	.1Ω	S-17908		
L12	Sound Take Off	3.2Ω	2.1Ω	S-18426		
L13	Peaking Coil	5.6Ω		S-16356		Red Dot
L14	Peaking Coil	12.2Ω		S-17958		White Dot
L15	Peaking Coil	9Ω		S-17957		Yellow Dot
L16	Sound IF	5.2Ω		S-17954		Tap 1 at 3.6Ω Tap 2 at 4.6Ω
L17	Quadrature Coil	5Ω		S-17955		
L18	Horiz. Osc.	130Ω		S-17114		Tap at 54Ω
L19	Width Coil	15Ω		S-18420		Tap at 2Ω
L20	Horiz. Lin.	9.5Ω		S-18421		

FUSES

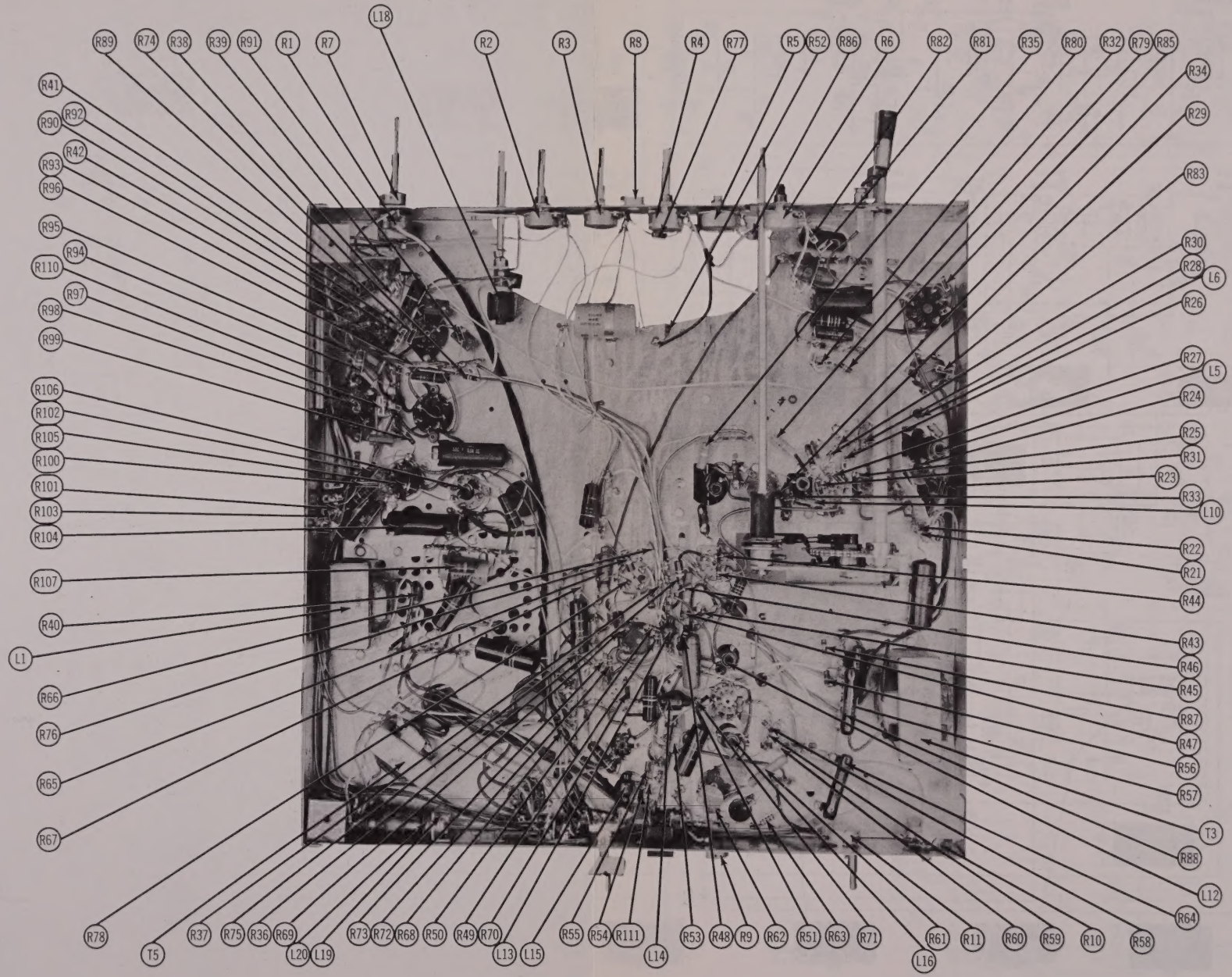
ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			ZENITH PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Slo Blo	175MA	136-21	83-1883	313.175	357001	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ZENITH PART No.		
M2	Bayonet	6-8	.15	Brown	100-36		Type No. 47

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	RF Tuner	S-17947	
M4	4th Video IF	S-17913	Video Det. Assy.
	Capacitor	22-1874	7MMF
	Crystal	103-1	IN64
	Peaking	S-17912	
	Peaking	S-17911	
	RF Choke	S-15128	
	Resistor	63-1810	3.9KΩ
	Resistor	63-1827	10KΩ
M5	Integrator Network	87-1	
M6	Centering Magnet	S-18118	
M7	Ion Trap	S-17164	
B1	Trimmer	22-2291	50-300MMF (Horiz.Drive)
	Channel Strip Assy	S-17982	Channel #2
	Channel Strip Assy	S-17983	Channel #3
	Channel Strip Assy	S-17984	Channel #4
	Channel Strip Assy	S-17985	Channel #5
	Channel Strip Assy	S-17986	Channel #6
	Channel Strip Assy	S-17987	Channel #7
	Channel Strip Assy	S-17988	Channel #8
	Channel Strip Assy	S-17989	Channel #9
	Channel Strip Assy	S-17990	Channel #10
	Channel Strip Assy	S-17991	Channel #11
	Channel Strip Assy	S-17992	Channel #12
	Channel Strip Assy	S-17993	Channel #13
	Knob	46-885	Contrast
	Knob	46-887	Horiz. Hold
	Knob	46-893	Brightness
	Knob	46-895	Fine Tuning
	Knob	46-896	Vert. Hold
	Knob	46-931	Channel Selector
	Knob	46-932	Off/On - Volume
	Knob	46-833	Off/On - Volume (J2030E)
	Knob	46-935	Channel Selector (J2030E)



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